ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED EPA REGION 9 LABORATORY AT THE UNIVERSITY OF CALIFORNIA'S RICHMOND FIELD STATION

Prepared for:

U. S. Environmental Protection Agency
Region 9
215 Fremont Street
San Francisco, CA 94105

Prepared by:

Jones & Stokes Associates, Inc.
1725 - 23rd Street, Suite 100
Sacramento, CA 95816
916/444-5638

April 6, 1990

TABLE OF CONTENTS

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1. Introduction

PURPOSE AND REQUIREMENTS OF THE ENVIRONMENTAL ASSESSMENT

This environmental assessment (EA) has been prepared for the U. S. Environmental Protection Agency (EPA) to assess impacts associated with the construction of an EPA regional laboratory at the University of California Richmond Field Station. The facility would provide laboratory support for all of Region 9's environmental programs. The facility would include a single-occupant office and laboratory building with approximately 30,000 net usable square feet (nusf), a hazardous materials storage building, and parking for 40 vehicles. A mobile laboratory and other support vehicles would be located at the site.

The purpose of this EA is to determine whether the construction of the EPA Region 9 laboratory at the field station is a major federal action that could significantly affect the environment, in which case a full environmental impact statement (EIS) would be prepared and distributed for public review and comment. If no such determination is made, a finding of no significant impact (FONSI) may be prepared. This EA has been prepared pursuant to the National Environmental Policy Act (NEPA), the regulations of the Council on Environmental Quality (40 CFR Part 1500 et seq.), and the EPA NEPA regulations (40 CFR Part 6).

The EA is a public document used to analyze the environmental effects of a proposed project, indicate possible ways to reduce or avoid the possible environmental damage, and to identify alternatives to the project. The EA discloses significant environmental impacts, growth-inducing impacts, effects found not to be significant, and significant cumulative impacts of all past, present, and reasonably anticipated future projects.

Prior to construction of the EPA laboratory, an EIR must be prepared to assess the environmental impacts pursuant to the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.). Approval or rejection of the EIR would be determined by the Regents of the University of California. CEQA requires that all state and local government agencies consider the environmental consequences of projects over which they have discretionary authority. Approval and construction of the EPA laboratory project constitutes a project under CEQA.

SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The EA contains 10 chapters and one technical appendix. The EA addresses land use and policy issues, public utilities and services, hazardous materials, circulation, air quality, noise, biotic resources, geology and soils, and cultural resources.

LEVELS OF SIGNIFICANCE

The EA uses the following five definitions for levels of significance for impacts.

- A "less-than-significant" impact would result in no substantial adverse change in the environment and would not require mitigation, although mitigation measures may be applied as deemed suitable.
- A "potentially significant" impact may or may not result in a substantial adverse change in the environment. It is equivalent to a "significant" impact but is used to demonstrate uncertainty. The potentially significant designation is used in two circumstances: 1) when it is unknown if an impact will occur and 2) when an impact can have a variable affect that is unknown. A potentially significant impact must be mitigable to a less-than-significant level.
- A "significant" impact is one that would result in a substantial adverse effect on the environment and that must be mitigable to a less-than-significant level.
- A "significant and unavoidable" impact is one that would result in a substantial adverse effect on the environment and for which no mitigation is available to reduce the impact to a less-than-significant level.
- A "beneficial" impact is one that would result in a beneficial effect on the environment.

ACRONYMS AND ABBREVIATIONS

The following acronyms and abbreviations are used in this report.

AB	Assembly bill
AC	Alameda County
BAAQMB	Bay Area Air Quality Management District
CAA	Clean Air Act
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act

CNEL	community noise equivalent level
CO	carbon monoxide
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel scale
DOT	U. S. Department of Transportation
EA	environmental assessment
EBMUD	East Bay Municipal Utility District
EIR	environmental impact report
EIS	environmental impact statement
EPA	U. S. Environmental Protection Agency
FONSI	finding of no significant impact
Kv	kilovolt
Ldn	day-night average sound level
Leq	equivalent noise levels
LI/R & D	light industry/research and development
MGD	million gallons per day
M-S	special industrial district
NEPA	National Environmental Policy Act
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NPDES	National Pollution Discharge Elimination System
nusf	net usable square feet
PCB	polychlorinated biphenyls
pers. comm.	personal communication
PG&E	Pacific Gas and Electric Company
psi	pounds per square inch
QAPP	quality assurance program plan
RAS	routine analytical service
RCRA	Resource Conservation and Recovery Act
RFD	City of Richmond Fire Department
RFS	University of California Richmond Field Station
RPD	City of Richmond Police Department
SAS	special analytical service
SCDS	Shoreline Conservation and Development Plan
SOW	statement of work
TSCA	Toxic Substances Control Act
TTLC	total threshold limit concentration
V/C	volume to capacity ratio

CHAPTER 2. Project Description and Background

PROJECT LOCATION AND SITE DESCRIPTION

Location

The proposed project site is located within the University of California Richmond Field Station in the City of Richmond in southern Contra Costa County (Figures 2-1 and 2-2). The field station is approximately 8.5 miles northeast of San Francisco and 4 miles northwest of the main Berkeley campus on the north shore of the San Francisco Bay. The field station is bordered by Regatta Boulevard (previously South 32nd Street) to the west; Regatta Boulevard, Seaver Avenue, and Meade Street to the north; and South 46th Street to the east. The project site is located at the northeast intersection of Avocet Way and Heron Drive.

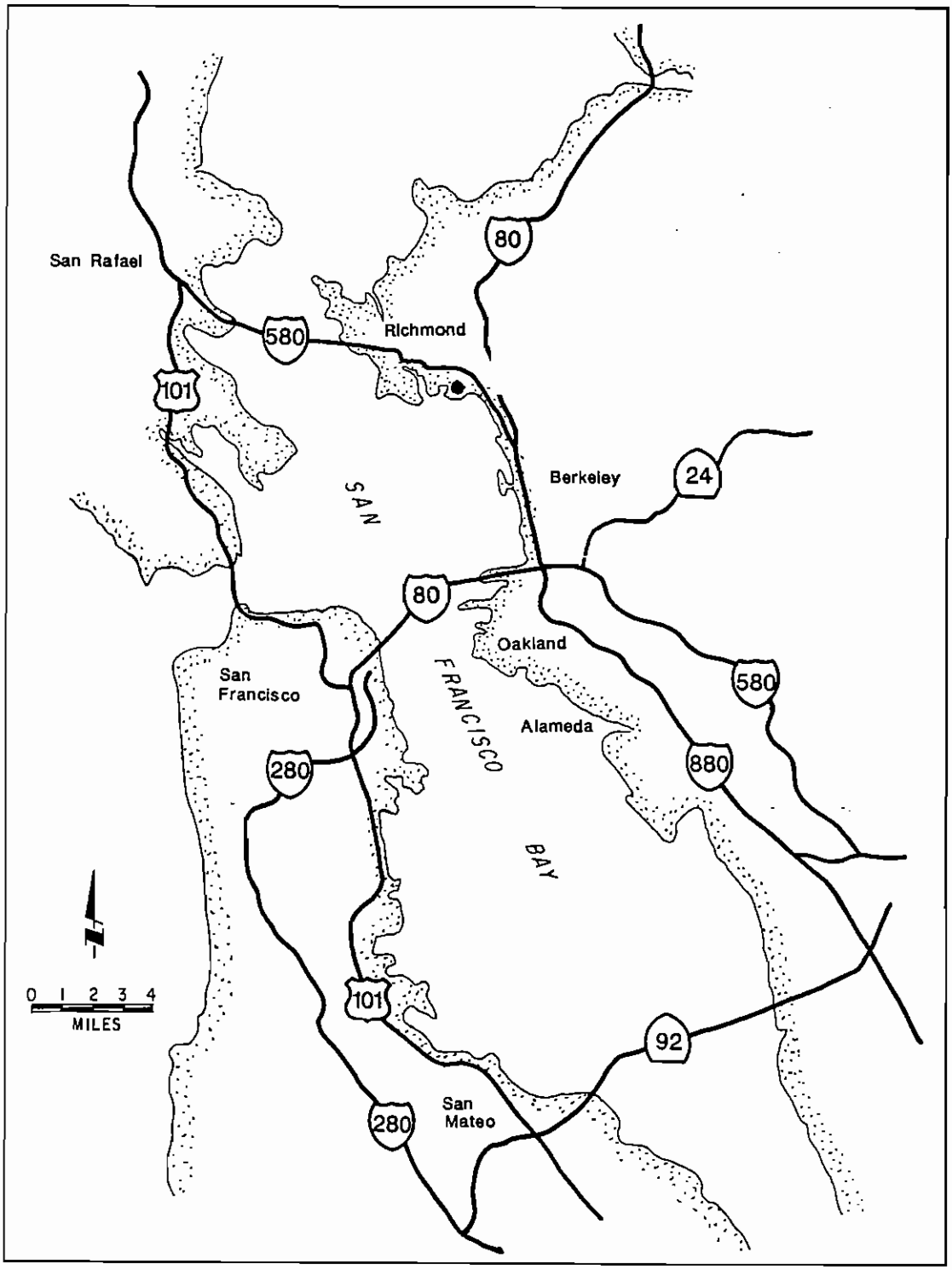
Site Access

The University of California intends to use the field station's main gate at South 46th Street and Regatta Boulevard for access to the EPA laboratory. The facility's driveway would be located on Avocet Way. The university may consider providing multiple access points to the field station allowing users of the EPA laboratory to reach the site via Regatta Boulevard and Lark Drive (the westernmost stretch is also known as Griffin Avenue). These entrances are part of the field station's master plan.

Lark Drive currently deadends 120 feet east of Regatta Boulevard on the field station, but is proposed to be extended to Regatta Boulevard as a part of the field station's master plan. User access to the laboratory would be via Regatta Boulevard near the Price Club and Bio Rad Laboratories at a location identified by the university as "Gate 7."

Facility Description

The project site extends 490 feet along Heron Drive and 330 feet along Avocet Way (Figure 2-3). It encompasses 3.17 acres. Improvements to the site would include construction of the laboratory, a hazardous materials storage structure, a boiler building, waste treatment and holding tanks, secured parking for EPA vehicles, and 38 parking spaces for 25 staff and visitors. The EPA laboratory would consist of a single story building with 45,855 gross square feet. The east side of the site would be reserved to accommodate a



Richmond Field Station

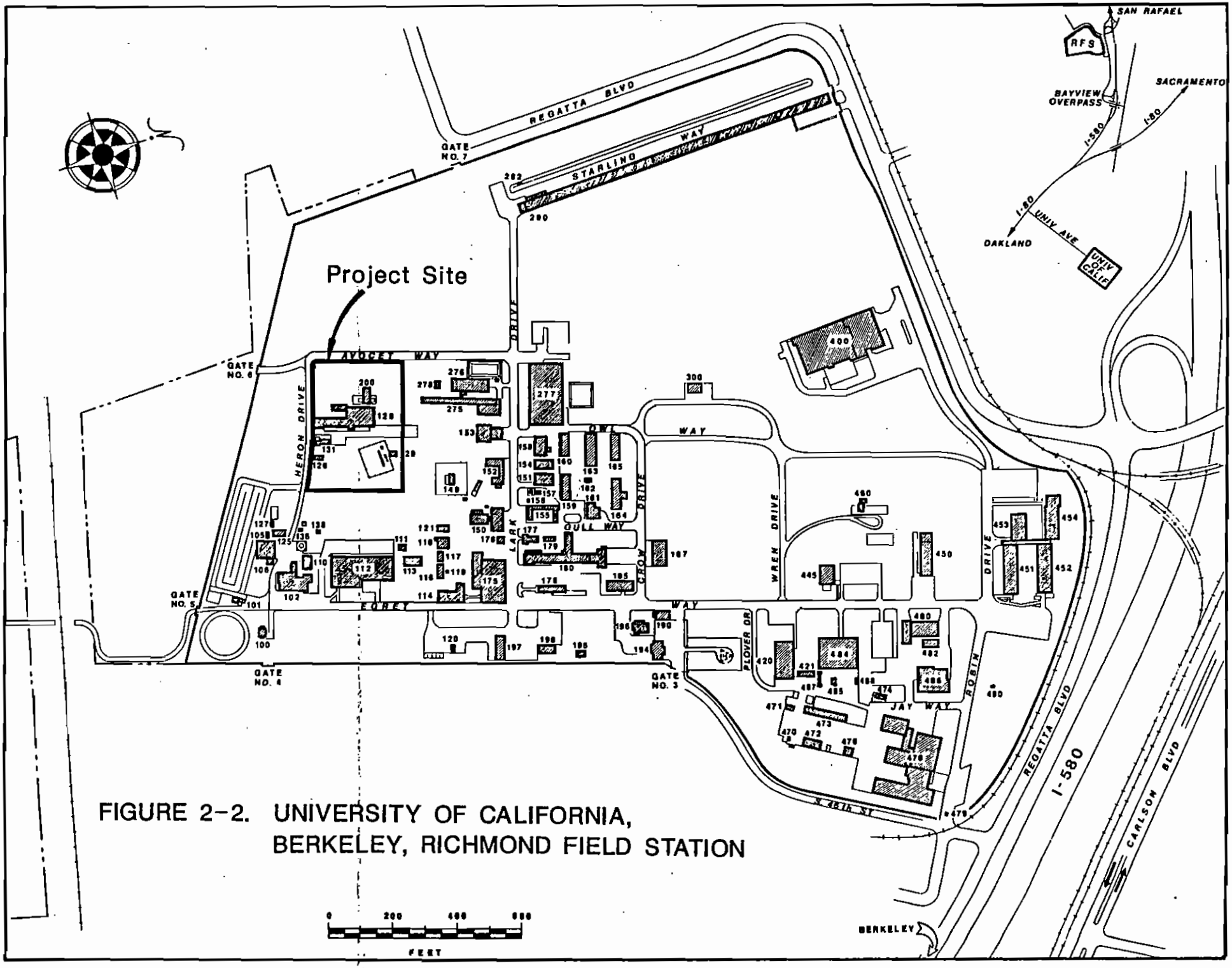


FIGURE 2-2. UNIVERSITY OF CALIFORNIA, BERKELEY, RICHMOND FIELD STATION

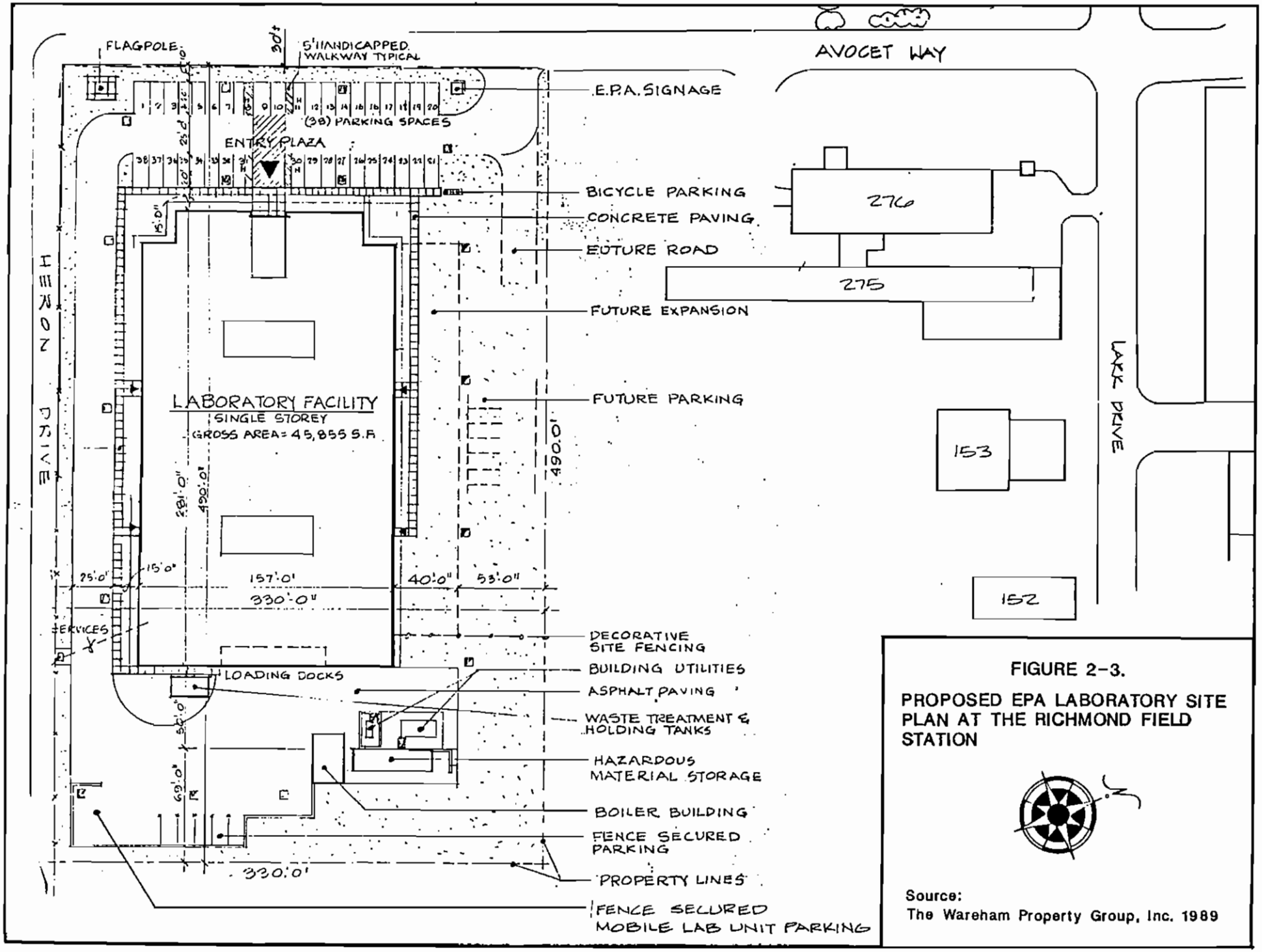


FIGURE 2-3.

PROPOSED EPA LABORATORY SITE PLAN AT THE RICHMOND FIELD STATION

Source:
The Wareham Property Group, Inc. 1989

future 25-percent expansion of laboratory operations and future parking. At buildout, the laboratory would house 40 employees.

U. S. ENVIRONMENTAL PROTECTION AGENCY DEVELOPMENT PROCESS

Consolidation of Regional Laboratory Operations

This project would provide a complete laboratory facility in one central location to serve the EPA's (Region 9) regional laboratory needs. The EPA, Region 9, presently operates a laboratory in Las Vegas, Nevada. The EPA also has a field staging area in Alameda, California. The EPA intends to consolidate these operations to create a more efficient and centralized operation. The field station is being considered as a site for the consolidation.

Bidding and Site Selection Process

The EPA's quest for a laboratory site began in 1989, when it released the program of requirements or specifications for the bidding process, construction requirements, space needs, and standards. The EPA held a preproposal workshop where the program of requirements was distributed and questions by prospective developers were responded to. Roughly 15 firms attended the prebid meeting, but only two groups submitted bids on the project.

The EPA provided the following site criteria and thereby narrowed the site selection process.

- The facility must be within the area from and including the City of San Francisco to the San Mateo Bridge, with easy access to Highway 101, and the East Bay Area from and including the City of Richmond to the San Mateo Bridge, with easy access to Interstate Highways 80, 880, and 580. Suitable cities include Albany, Alameda, Berkeley, El Cerrito, Emeryville, Hayward, Millbrae, Oakland, Richmond, San Bruno, San Francisco, San Leandro, San Lorenzo, San Mateo, or South San Francisco.

- The site shall be directly accessible to major transportation facilities.

- The site shall be in an area that is reasonably free from organic and inorganic chemical fumes to avoid contamination of the facility's chemical analysis program. Outside air intakes will be located to provide the cleanest possible source of air, and all air will be filtered prior to entering the building.

- The building must be located at least 50 feet from the property line and 100 feet from other buildings.

- The site must allow for a 25-percent future laboratory expansion.

- The facility must have 30,000 nusf in a single story: 1,080 nusf for administrative office space, 3,264 nusf for administrative support space, 13,488 nusf for laboratory space, 3,375 nusf for laboratory office space, 2,040 nusf for laboratory support, and 5,880 nusf for general storage, field storage, workshop, staging, and field calibration space. A separate structure with approximately 840 nusf would be needed to store hazardous materials.

  A paved parking area is needed for 40 vehicles and a paved area of 40 by 50 feet is needed to park three mobile laboratories, a van, and a laboratory trailer. Five of the 40 spaces would be for official vehicles and would be in a secured area, preferably in the rear of the facility. Additional parking for bicycles and motorcycles should be provided. (U. S. Environmental Protection Agency 1988a.)

UNIVERSITY OF CALIFORNIA DEVELOPMENT PROCESS

The University of California is seeking to establish a state, federal, and private-sector facility as a solid anchor for future development of a research center at the field station. The Wareham Property Group (Wareham) has been retained by the University of California to develop the EPA laboratory. The University of California will continue to hold the property title and Wareham will have a 20-year lease on the parcel with an option to extend the lease for an additional 20 years. Wareham will own the structure and the EPA will lease the structure (Hufferd pers. comm.).

Site Selection

The university chose this project site because it is located within the Richmond Field Station research center, which is a proposed future land use in the field station master plan (the master plan has not been adopted by the University of California). Figure 2-4 depicts a preliminary schematic diagram of the proposed research center. In addition, this site is near existing infrastructure including electrical, telephone, water, sewer, and gas lines. Also, most of this site is presently developed, which reduces the potential for disruption to sensitive habitat.

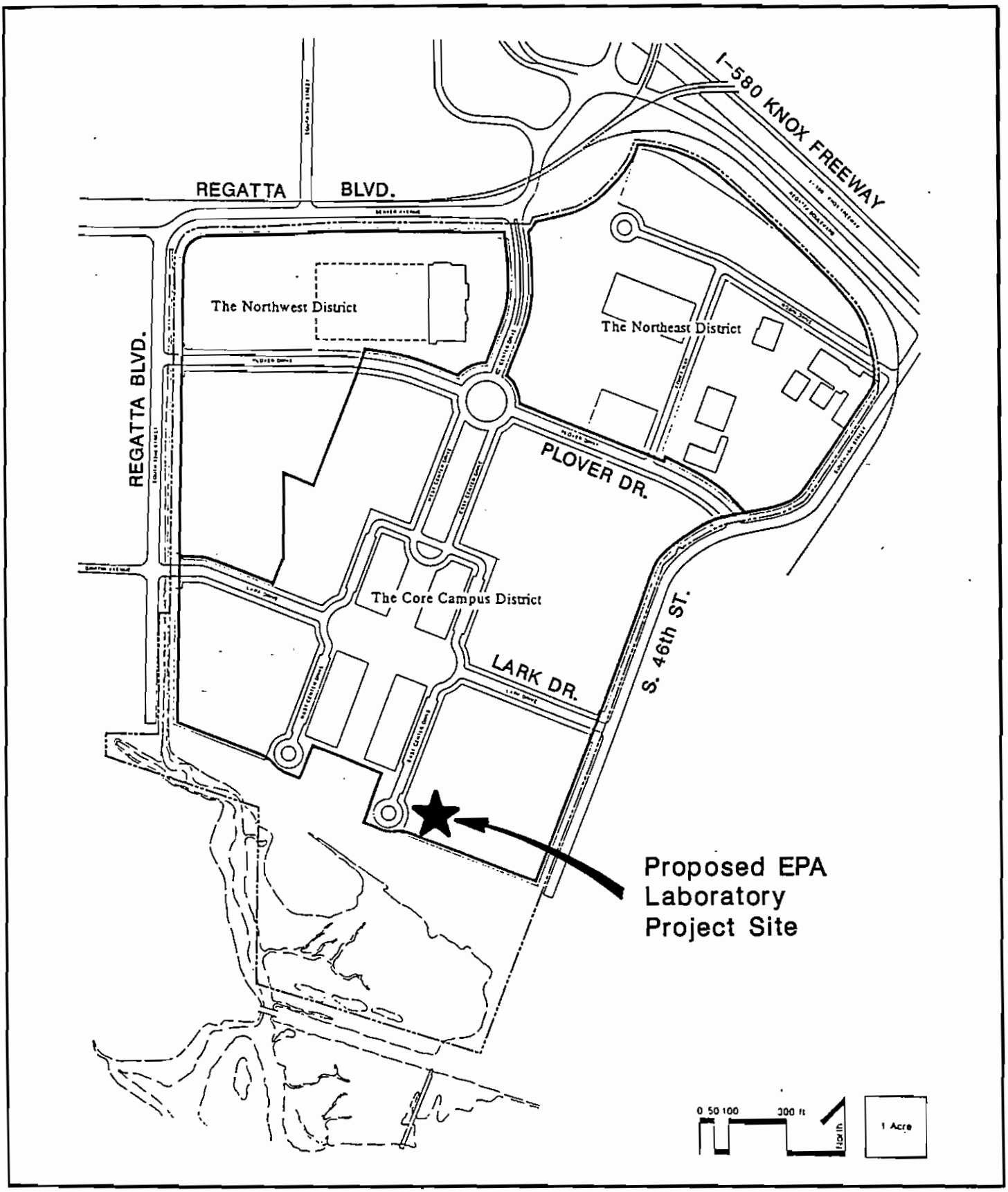


FIGURE 2-4. UNIVERSITY OF CALIFORNIA AT BERKELEY PRELIMINARY RESEARCH CENTER DISTRICT PLAN

Source: Wallace Roberts & Todd 1989

LABORATORY OPERATIONS

Objectives of the Regional Laboratory

The mission of the Region 9 laboratory is to perform sample analysis in support of regional environmental monitoring and enforcement efforts. The lab analyzes water, animal and plant tissue, soil, sediment, dust, oil, and solid and liquid wastes using prescribed EPA protocol (U. S. Environmental Protection Agency, Region 9, 1988b).

The laboratory provides analyses for regional programs under the following federal laws:

- Clean Water Act ([CWA]; also known as the Federal Water Pollution Control Act [FWPCA]) (33 U. S. C. §1251);
- Resource Conservation and Recovery Act (RCRA) (42 U. S. C. §6901);
- Superfund Amendments and Reauthorization Act (42 U. S. C. §9601);
- Toxic Substances Control Act (TSCA) (15 U. S. C. §2601); and
- Clean Air Act (CAA) (42 U. S. C. §7401) (U. S. Environmental Protection Agency, Region 9 1988b).

Existing Laboratory Operations

Las Vegas, Nevada Laboratory

The Las Vegas laboratory's primary function is to test environmental samples (e.g., sediment, water, and fish samples) obtained in and around hazardous waste sites. Most of the Las Vegas laboratory's work (i.e., more than 50 percent) involves the Superfund hazardous waste cleanup program. Superfund sites are hazardous waste sites requiring cleanup and/or closure by the federal government using funds from the Hazardous Substance Superfund established under Subchapter A of Chapter 98 of Title 26. A discussion of the Superfund program can be found in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA; 42 U.S.C. §§9601 to 9675).

The laboratory also works on analyses resulting from the Safe Drinking Water Act, the Clean Water Act, underground injection control, the Clean Air Act, and the Resource Conservation and Recovery Act. The laboratory testing performed under these federal statutes includes evaluation of effluent samples and testing of samples from underground injection wells, pretreatment programs, and waste disposal sites (Husby pers. comm.).

The lab performs routine analytical services (RAS) following EPA-approved methods, as well as special analytical services (SAS), also governed by EPA's laboratory

operation manuals. RAS include testing for organic compounds, including pesticides and semivolatile substances; testing for inorganic chemicals; and analyses of metals and cyanide. SAS include analysis of miscellaneous cations (e.g., calcium and magnesium) and anions. The tests are recorded in the CERCLA Statement of Work (SOW) 788 and the Resource Conservation and Recovery Act SOW 846. (Smiecinski pers. comm.) The laboratory is required to abide by all applicable federal, state, and local hazardous waste and air quality regulations (Husby pers. comm.). The lab occasionally develops procedures that are not documented in the SOWs. For example, the lab recently created a procedure to identify bromine in environmental samples (Smiecinski pers. comm.).

The lab is equipped with ventilation hoods designed to quickly remove fumes that are a potential health hazard. These fumes are diluted and filtered in a system described as absolute filtration and then released into the environment (U. S. Environmental Protection Agency 1988a). Approximately 6 gallons of methylene chloride (similar to paint remover) are used each week in the hood ventilation system to extract volatile organic chemicals. Methylene chloride is considered a priority pollutant by the EPA. Roughly 1 gallon of methanol (similar to acetone) is also used each week and released into the hood ventilation system. Approximately 2-3 gallons of hydrochloric acid and nitric acid are used each week in digestion processes, also within the hood ventilation system. The processing of hazardous wastes at the Las Vegas laboratory is discussed in Chapter 5, "Hazardous Substances."

Alameda Facility

The Alameda facility is used as a field staging area. Its primary functions consist of storing sampling and field equipment and culturing organisms, including algae, fish, sea urchins, and invertebrates, for use in toxicity tests of effluent and ambient samples. The EPA also performs some water quality tests on wastewater treatment plant effluent at the Alameda facility (Husby pers. comm.).

Proposed EPA Laboratory Operations

The following operations would occur at the new EPA laboratory:

- analysis and extraction of pesticides, herbicides, polychlorinated biphenyls (PCBs), and other extractable organics;
- analysis of volatile organic trihalomethanes, all volatiles from the priority pollutant list, and all volatiles from the priority list of drinking water contaminants;
- analysis of extractable organics;
- preparation of fish samples for priority pollutant analysis;
- analysis of fluorides, sulfides, and cyanides;

- analysis of water, wastewater, and soil samples, including pH and conductivity testing; testing for the presence of chloride and phosphates; photometric measurements; and electrometric measurements;
- digestion of inorganic samples, such as mercury, on hot plates;
- radiochemical analysis of water, soil, and sewage samples;
- bioassay of fish, invertebrates, and plants;
- microbiological testing for pathogenic organisms such as salmonella, shigella, and giardia;
- bacteriology, parasitology, and virology testing using commercially prepared, dehydrated media;
- analysis of samples potentially containing asbestos using transmission electron microscopy and polarized light microscopy; and
- calibration of state and local ozone photometers.

CHAPTER 3. Land Use and Policy Issues

AFFECTED ENVIRONMENT

Regional Land Use

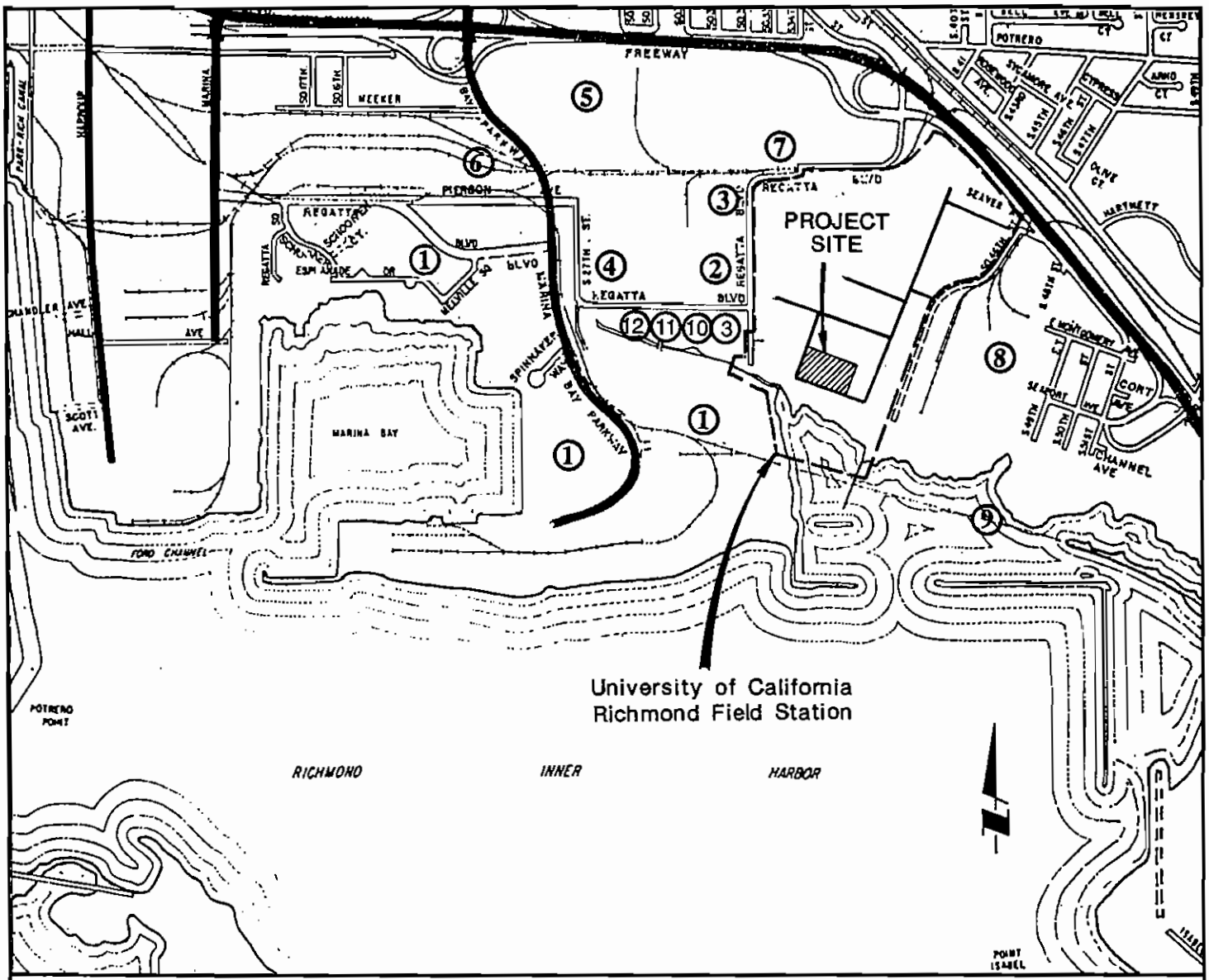
The University of California field station is located in the south part of the City of Richmond on the shore of the Richmond Inner Harbor in Contra Costa County. Richmond is bordered by El Cerrito and Albany to the southeast and east, El Sobrante and Pinole to the north and east, Point Richmond to the west, and the San Francisco Bay to the south (Figure 2-1).

Local Land Use

The project site is located in an area dominated by industrial land uses located south of Interstate Highway 580 (I-580; also known as the John T. Knox Freeway). The area was formerly developed with heavy industrial land uses but these have been replaced over the past several years by commercial, residential, and light industrial land uses. The recent extension of I-580 through this area has been a partial catalyst for the changes in land use.

Surrounding industrial, research and development, and warehousing land uses include Bio Rad Laboratories, Chemical Division, the Safeway distribution center, Imperial Chemicals Industry of America, Inc. (ICI; an agricultural chemical laboratory and manufacturing facility), and a California Department of Transportation (Caltrans) equipment storage yard (Figure 3-1). ICI is in the process of converting the old Stauffer chemical manufacturing facility (east of field station) to a laboratory and greenhouse with a small chemical manufacturing division. Safeway also has a regional bakery within the vicinity of the project site. Safeway is considering moving their distribution center to Tracy, California.

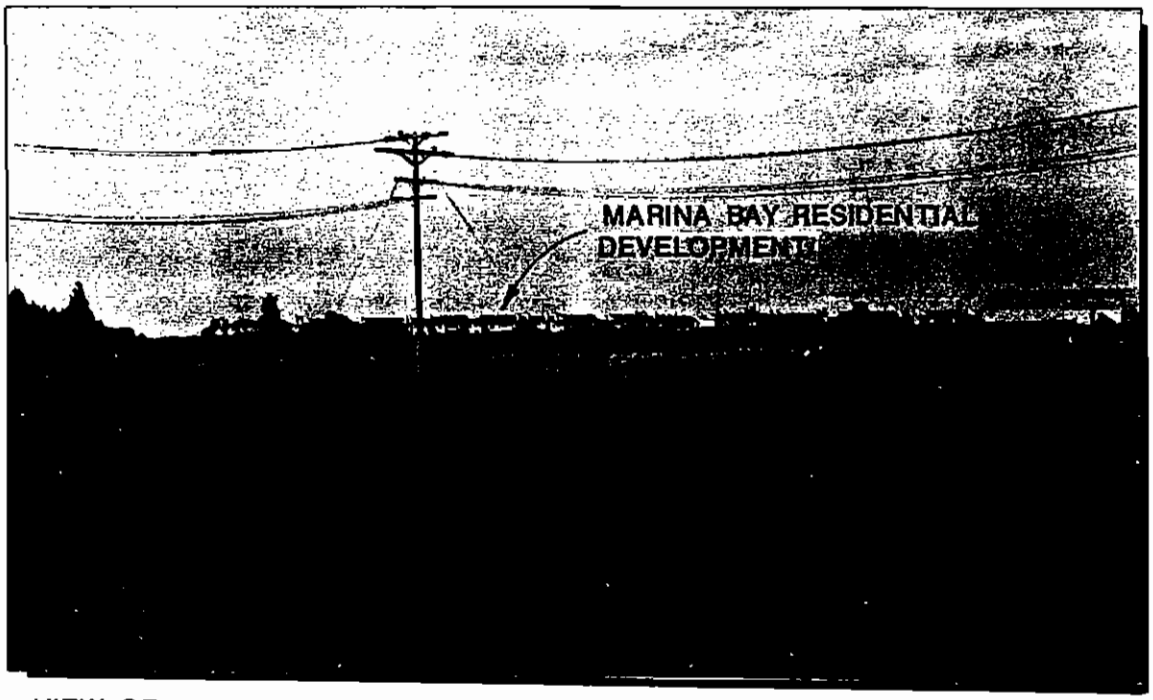
The Marina Bay project (consisting of shoreline residential, commercial, business, and marina development), located southwest of the site, is partially constructed (Figure 3-2). Marina Bay is located on the bay shoreline approximately 500 feet from the site. Upon completion, Marina Bay will include 1,200 rental units, townhouses, and single family residential units. A portion of Marina Bay farther west of the project site has been completed and is occupied.



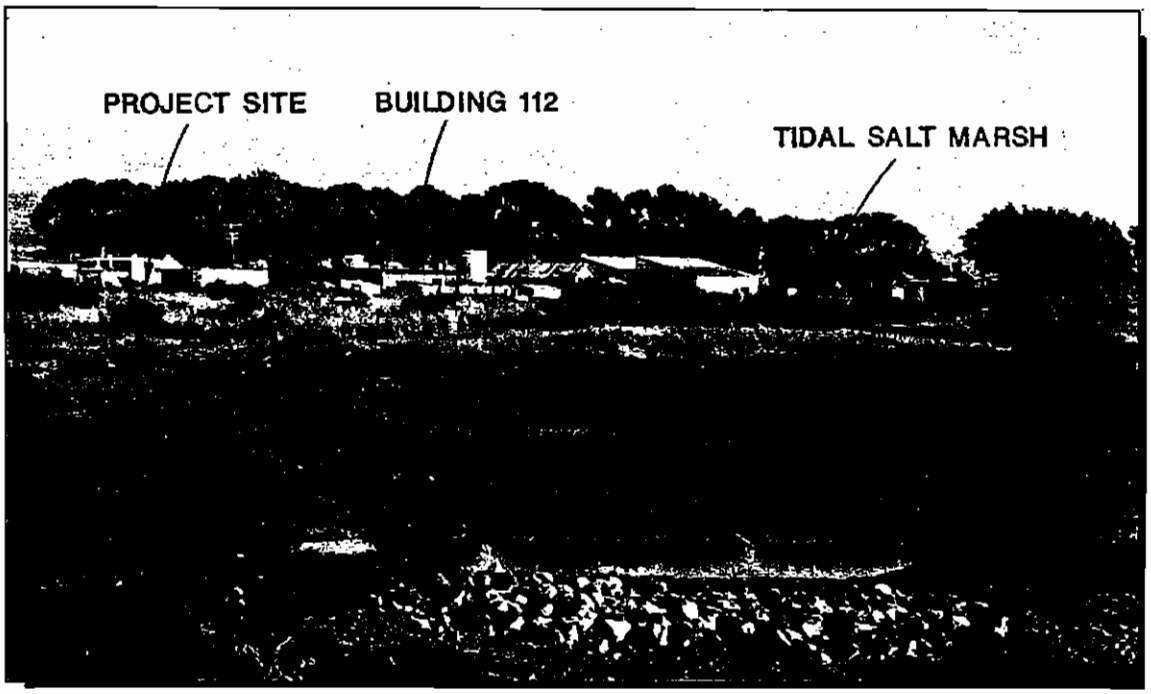
Key:

1. Marina Bay Mixed Use Development (Residential, Commercial, Office, and Recreational Land Uses)
2. Price Club (Off-price Retail)
3. BioRad Laboratories
4. Pacific Gas & Electric
5. Safeway Distribution Center
6. Railyard
7. Caltrans
8. ICI America (Chemical Laboratory and Manufacturing Facility)
9. Santa Fe Railroad
10. Sequoia Trucking
11. Technical Safety Services
12. Richmond Wholesale Services

FIGURE 3-1. LAND USES IN THE VICINITY OF THE PROJECT SITE RICHMOND, CALIFORNIA



VIEW OF MARINA BAY MIXED-USE DEVELOPMENT FROM THE PROJECT SITE



VIEW OF THE PROJECT SITE FROM MARINA BAY

FIGURE 3-2

Richmond Field Station Land Uses

The 150-acre field station was acquired by the University of California in 1950. Approximately 50 acres of field station are used for large-scale university research projects, including the Sanitary Engineering and Environmental Health Research Laboratory, the Forest Products Laboratory, and the Earthquake Engineering Research Center. The Northern Regional Library Facility for the University of California is also located at the field station and is currently being expanded to increase storage capacity. Other small individual research projects are also located at the field station (Figure 3-3).

A concrete-lined storm drainage channel (a portion of which is known as Meeker Ditch), owned by the City of Richmond, borders the west perimeter of the field station, parallel to Regatta Boulevard. Avocet Way and a vacant field border the west boundary, and Heron Drive and a second vacant field abut the south property boundary. The San Francisco Bay shoreline and an extensive tidal salt marsh lie 250-500 feet south of the site beyond a ruderal field (Figure 3-2). The remaining 100 acres of the field station can be characterized as undeveloped upland property and shoreline marsh.

Project Site Land Uses

The project site is located on the south side of the field station at the northeast corner of the intersection of Avocet Way and Heron Drive. Buildings 126, 128, 129, 131, and 200 are within the project site boundaries (Figures 2-3 and 3-4). The uses and occupants of these buildings include:

- 126 - storage for the Mechanical Engineering Department;
- 128 - solid waste recycling, research and development for Waste Energy Technology (a private company);
- 129 - vacant, previously used for water technology, an organized research unit (ORU);
- 131 - storage for the Engineering Department, Office of Research Services and Industry Liaison; and
- 200 - vacant; previously used by the Naval Architecture and Offshore Engineering Department (Kuykendall pers. comm.).

Waste Energy Technology is moving out of building 128 into a facility located in Benicia. Their lease expires in March 1990 (Kuykendall pers. comm.). All of the buildings onsite are single story except for building 200. A sixth, unnumbered building is located between buildings 128 and 129. It is a dilapidated, corrugated metal storage shed that is no longer in use. A redwood tank is located next to the shed. A loading platform and a shipping container are located between buildings 126 and 138. Building 129 has a fenced yard. Most of these uses seem to be remnants of previous research projects.

Other features of the site include a fire hydrant at the corner of Heron Drive and Avocet Way, some landscaping, a volleyball court, a small parking lot, a large portable

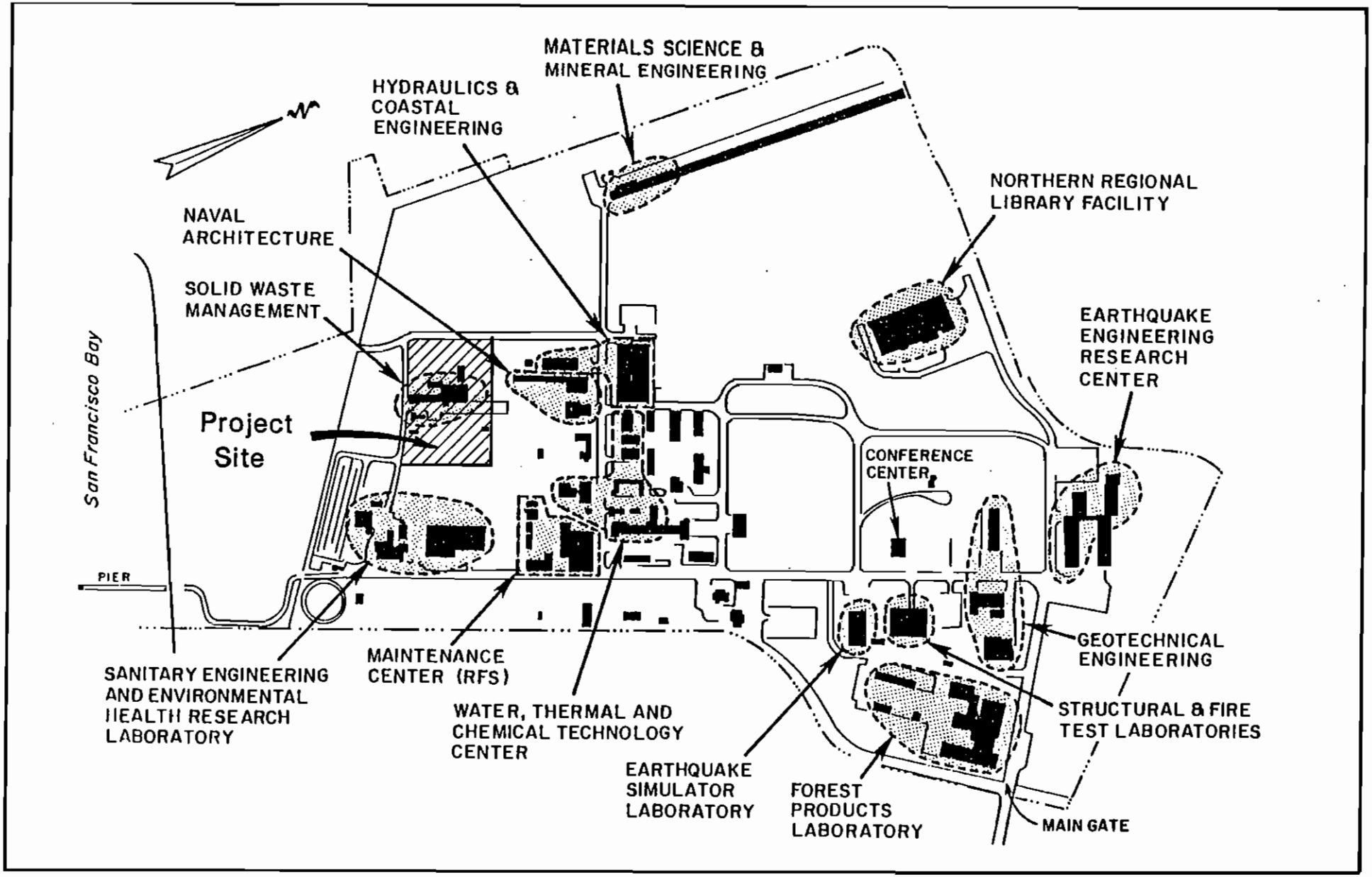


FIGURE 3-3. RESEARCH PROJECTS AT THE RICHMOND FIELD STATION

Source: University of California at Berkeley

garbage bin, and a power line crossing the site. A transformer containing PCBs is mounted on one utility pole on the project site.

Buildings 102, 105, 106, 111, 112, 118, 121, 125, 127, 136, 138, 149, 150, 152, 153, 176, 275, 276, and 278 are located on the north and east sides of the project site. The uses and occupants of these buildings include the following (Kuykendall pers. comm.):

- 102, 105, 106, 110, 112, 113, and 127 - laboratories and support facilities for the Sanitary Engineering and Environmental Health Research Laboratory (Figures 2-2 and 3-5);
- 111 - hazardous materials storage for the Sanitary Engineering and Environmental Health Research Laboratory;
- 114 - storage for Richmond Field Station Administration;
- 117, 118, and 119 - maintenance shop for the field station;
- 118 - fire test research laboratory for the Civil Engineering Department;
- 121 - storage of grounds maintenance equipment for the Engineering Department, and Office of Research Services and Industry Liaison (facilities management);
- 149 - vacant; previously used for water technology, ORU;
- 150 - machine shop for the Sanitary Engineering Department and for the Environmental Health Research Laboratory, and a laboratory for the University of California at San Francisco;
- 152 - storage for the Engineering Department, and facilities management;
- 153 - research support services and a modeling shop for the Naval Architecture and Offshore Engineering Department;
- 175 - administrative offices for the field station;
- 176 - vacant; previously used for storage;
- 275 - research towing tank for the Naval Architecture and Offshore Engineering Department;
- 276 - research towing tank for the Hydraulic and Coastal Engineering Department; and
- 278 - equipment storage for the Hydraulic and Coastal Engineering Department.

Applicable Plans and Policies

University of California Planning Documents

Long-Range Development Plan and Richmond Field Station Master Plan. The University of California has a long-range development plan governing the development of

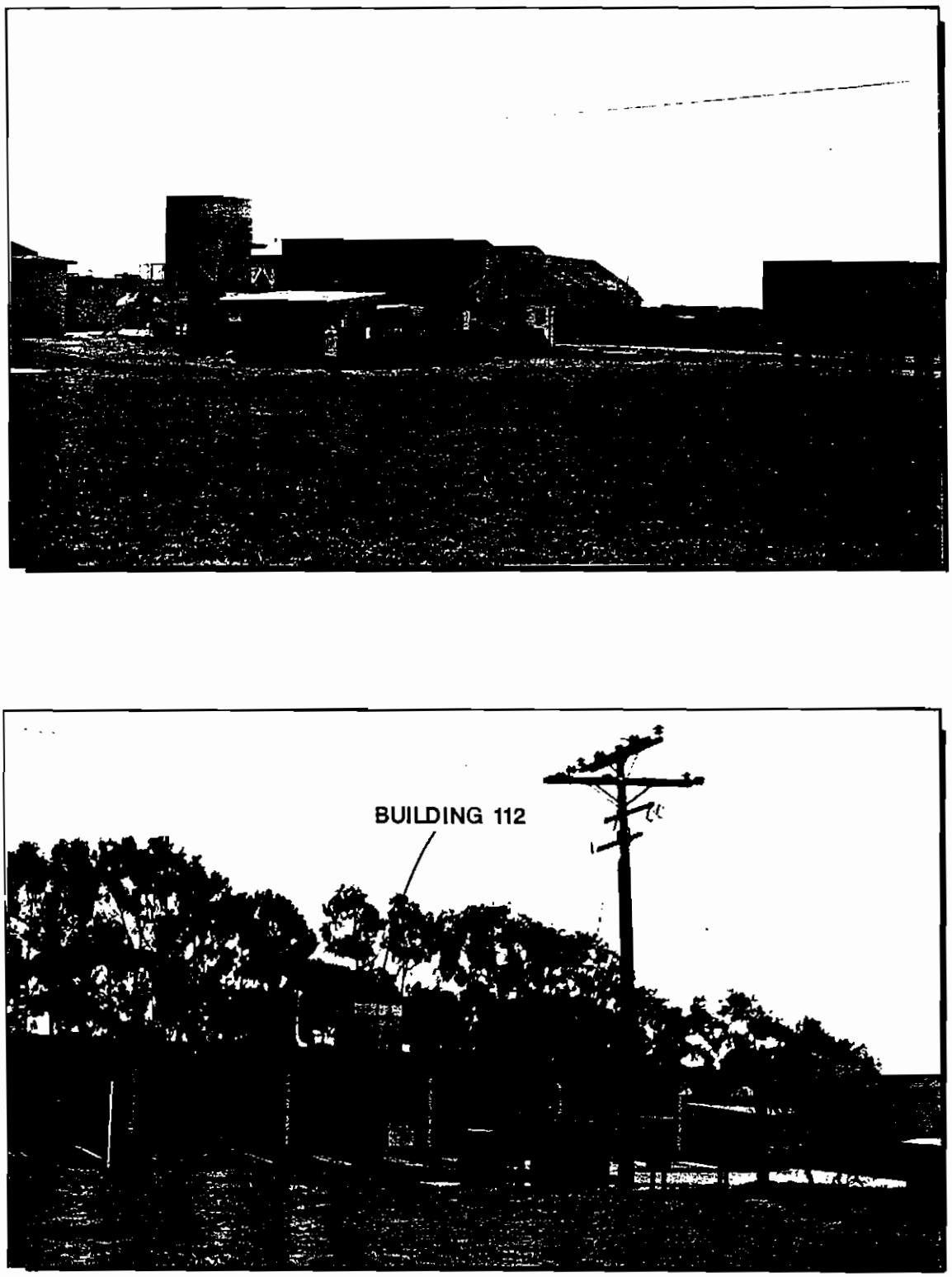


FIGURE 3-5. VIEWS OF ADJACENT SANITARY ENGINEERING AND ENVIRONMENTAL HEALTH RESEARCH LABORATORY FACILITIES

the Berkeley campus but no plan exists to guide development of the field station. The University of California is preparing a master plan for the field station that will be completed in May 1990. A preliminary draft of this document was prepared during fall 1989, but major revisions have since been made to the report. The plan has not been approved by the University of California, nor has it been evaluated under CEQA. Plan approval and CEQA evaluation (presumably preparation of an environmental impact report) should occur in 1990 (Hufferd pers. comm.).

The University of California would like to promote joint research ventures between academia and private industry by converting a portion of the field station to a research center for use by the university, private companies, and government agencies. Figure 2-4 depicts a preliminary schematic site plan of the research center. This site plan will probably be modified before the draft master plan is completed.

EPA Laboratory EIR. The University of California has begun the process of preparing an EIR for the EPA laboratory project. The University of California will act as the lead agency in the CEQA process. Construction of the EPA laboratory cannot begin until the EIR has been completed.

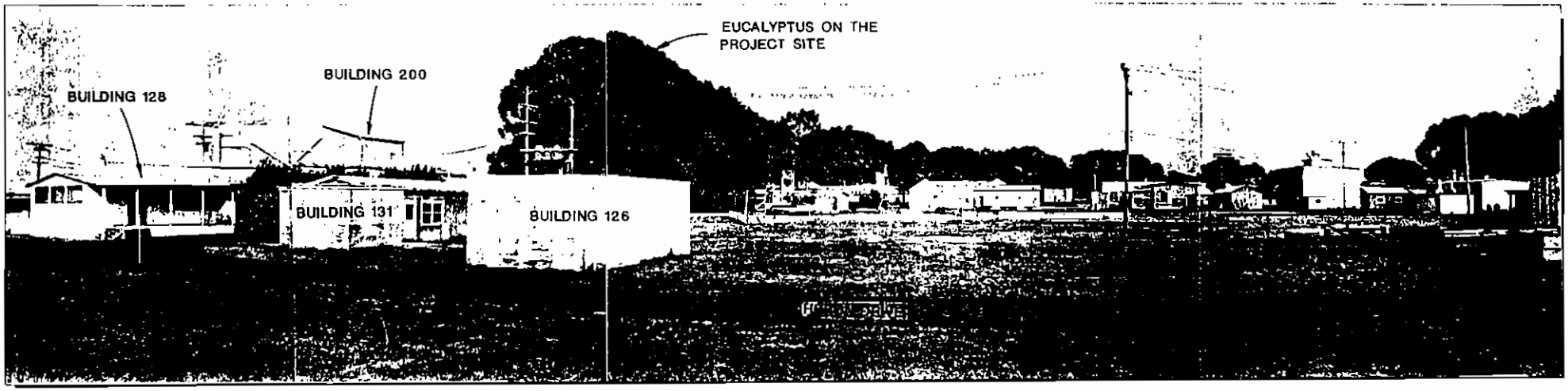
City of Richmond Planning Documents

The field station is located in the City of Richmond, but the city does not have legal jurisdiction over the activities of the field station because it is owned by the State of California. Thus, even though the City of Richmond's planning documents address the field station property, the University of California is not obligated to adhere to the City of Richmond's plans. Nonetheless, the University of California has expressed a desire to comply with all local plans and regulations even though the University of California may not follow the standard development procedures established by the City of Richmond.

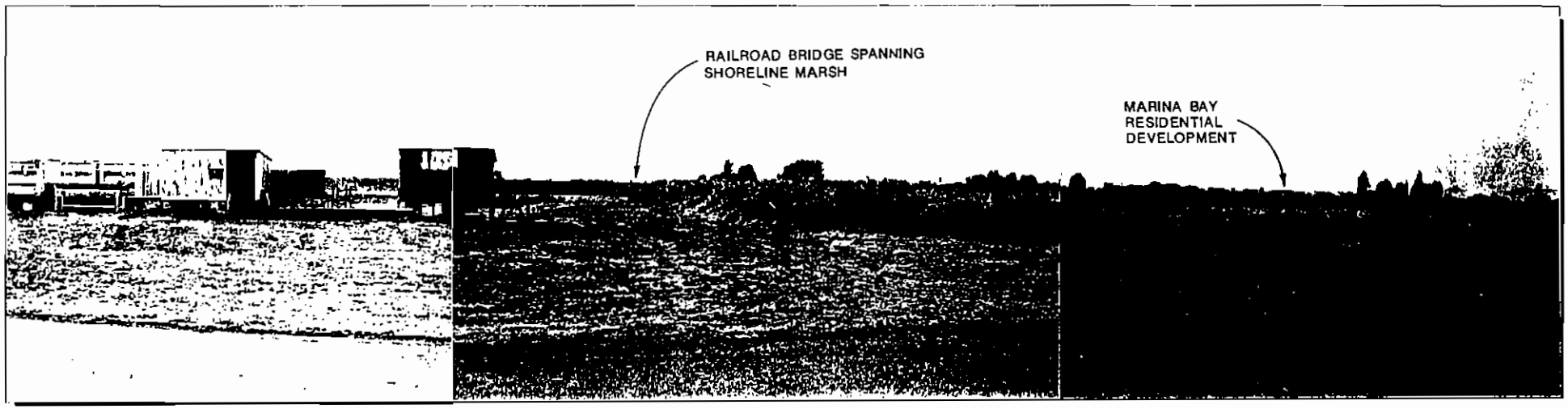
City of Richmond General Plan Land Use Element. The field station, including the project site, is designated as a "Special Industry" area by the Richmond General Plan (Richmond Planning Department 1987). Special industry land uses are located along major transportation routes in areas where compatibility with adjacent land uses is a primary concern. The field station is designated as a special industry land use because compatibility with the Marina Bay mixed use development project is an expressed concern of the City of Richmond. Industries creating significant negative externalities would be excluded from special industry areas (Richmond Planning Department 1987).

The following special industry general plan policies have been extracted from the Land Use Element of the Richmond General Plan and are relevant to the proposed project.

> Develop Special Industrial areas in locations where industrial plants can be seen by the traveling public and have convenient access to thoroughfares, railroad lines or shipping facilities. At key locations Industrial Parks should be developed and maintained to even higher standards.



VIEW OF THE PROJECT SITE AS SEEN FROM HERON DRIVE



VIEW FROM THE SITE LOOKING SOUTH TOWARDS THE SAN FRANCISCO BAY

FIGURE 3-4

Provide and maintain adequate landscaped open space between structures.

Set back all new buildings and structures from freeways and major thoroughfares a sufficient distance to provide a spacious setting.

Establish a visual unity of all buildings and structures.

Provide adequate off-street parking and loading facilities on each site with appropriate landscaping to help create an attractive appearance.

Average employee density [should not] generally exceed 10 persons per net site acre.

Limit all forms of activity that may be objectionable such as noise, odors, fumes, vibration, or glare so they will not be noticeable at the property line and preferably should be confined within each building. (Richmond Planning Department 1987.)

Shoreline Conservation and Development Strategy.

In 1986, the City of Richmond began work on a *Shoreline Conservation and Development Strategy* (SCDS) to guide development in the vicinity of Richmond's San Francisco Bay and San Pablo Bay shorelines. Baseline environmental data were collected in 1986 and compiled in a document entitled *SCDS Technical Memorandum Number 2, Planning Analysis* (Hall, Goodhue, Haisley, and Barker July 1986a). In November 1986, *SCDS Technical Memorandum Number 3, Land Use Alternatives*, was prepared. Finally, in 1987, Hall, Goodhue, Haisley, and Barker prepared recommendations for shoreline conservation and development strategies. These recommendations were adopted, in principle, in April 1987, by the Richmond City Council. Many of the recommendations are directives to the city for governing shoreline development. The selected recommendations that are applicable to the proposed project are presented as they appear in the summary of recommendations for the SCDS. Specific policies from the SCDS relating to the recommendations are also listed.

1. Prepare a Specific Plan necessary to implement the proposed Marina Bay Business Park in the area north, west, and east of Marina Bay, including a university-oriented Research Park, to take advantage of market demand for research and development, university and business-oriented uses, and associated employment opportunities.

Policy: Establish research and development uses in the South Shoreline Area west, north, and east of Marina Bay and extending south of Stauffer Chemical to Point Isabel. Establish the Marina Bay Business Park with university-oriented research and development uses near the UC Berkeley Richmond Field Station and general research and development uses north and west of Marina Bay.

9. Establish predictable development policies and regulations that encourage RandD [research and development] and biotechnology development as well as other uses.

12. Prepare and adopt a master streetscape plan that addresses the appearance of streets in the Shoreline Area, particularly the proposed collector road from Erlandson/Regatta Streets to Harbour Way and Route 93. This plan should include recommended street sections, landscape plant palette, hardscape palette, provisions for street lighting, furniture, and signage.

Policy: For new development, require landscaping and open space to amount to 10 percent or 15 percent of the gross land area, depending on land use, including at least 5 percent for usable open space.

Policy: Require that all parking be accommodated in off-street lots. Do not permit on-street parking.

Policy: Adopt a master streetscape plan that addresses the appearance of streets in the Shoreline Area. Subjects to be addressed include a landscape palette, hardscape palette, and provisions for street lighting, furniture, and signage.

13. Improve, extend, reroute, or close surface streets, as necessary, to provide an efficient and functional local street system.

14. Adopt an official Roadway Plan Line . . . in order to establish the route for a collector road from Erlandson/Regatta [Boulevard] to Harbour Way.

16. In conjunction with the East Bay Regional Park District, establish a public access plan that provides a system of nonmotorized circulation alternatives from Point Isabel to Point Pinole, along the Shoreline where possible.

Policy: Establish a public access trail, including Class 1 separated pedestrian and bicycling facilities as feasible, from the Albany city limit around Point Isabel to the Point Isabel Shoreline Park, then along the to-be-abandoned Santa Fe right-of-way to Meeker Ditch and the new park at South 47th Street.

Policy: Encourage the University of California to improve South 47th Street south of the freeway with provisions for pedestrian and bicycle access.

Policy: Promote and encourage the dedication of a park at the end of South 47th Street as part of the University of California Field Station master plan.

18. Conserve hillsides and wetlands, including the numerous marshes and streams in the Shoreline Area (Hall, Goodhue, Haisley, and Barker 1986b).

City of Richmond Zoning Ordinance. The City of Richmond Zoning Ordinance provides detailed regulations for research and development land uses, particularly those using hazardous substances. The following discussion addresses zoning requirements for the project site with the exception of those ordinances relating to the use of hazardous substances that are addressed in Chapter 5, "Hazardous Substances."

Special Industrial District. The project site is designated as "Special Industrial District" (M-S) in the City of Richmond Zoning Ordinance (Section 15.04.145) (City of Richmond Planning Department 1987). Within this zoning classification, the project site has a subclassification labeled "Light Industrial/Research and Development" (LI/R & D). The zoning ordinance provides explicit instructions for property development within the Special Industrial District, LI/R & D (City of Richmond Planning Department 1988).

The zoning ordinance identifies 23 uses that are permitted uses or that are allowed with a conditional use permit in the Special Industrial District. The EPA laboratory would most likely fit within the category of "Research and Development Activities." This land use is permitted in Special Industrial Districts, unless the use involves one of several activities, including:

- the use of viruses or infectious materials,
- the manipulation of genetic material of living organisms,
- uses classified by the National Institute of Health as large scale (greater than 10 liters of culture) research or production, or
- uses where the laboratory requirements are at a biosafety level two or above, as defined by the National Institute of Health and the Center for Disease Control (City of Richmond Planning Department 1988).

Onsite accessory uses that are permitted uses include parking lots, administrative offices, and outdoor storage areas that meet the conditions of the zoning district (City of Richmond Planning Department 1988).

The zoning ordinance also includes standards of operation regarding emissions, odors, noise, and vibrations. The ordinance also provides specific design standards for building heights and setbacks, sidewalks, landscaping, fencing, parking, and loading areas. The ordinance requires provision of sidewalks, curbs, and gutters on all public streets (City of Richmond Planning Department 1988).

The maximum allowed building height under the special industrial district ordinance is 50 feet. The minimum building setback on minor streets, such as Heron Drive and Avocet Way, is 15 feet. The ordinance requires, at a minimum, "green, growing ground cover" to be planted, which may include grass, shrubs, perennial flowers, and vines (City of Richmond Planning Department 1988).

San Francisco Bay Conservation and Development Commission

Jurisdiction. BCDC has permit authority over waters of the San Francisco Bay and the adjacent shoreline extending from the Golden Gate Bridge to Alameda, San Mateo, Contra Costa, Solano, Sonoma, San Francisco, and Marin Counties. BCDC's shoreline jurisdiction extends 100 feet inland from the highest tidal action. BCDC is mostly concerned with securing appropriate shoreline land uses and maintaining, enhancing, and expanding shoreline access for the general public (Aramburu pers. comm.).

When a project is within BCDC's limited jurisdiction, the project requires a BCDC permit prior to approval. BCDC issues two kinds of permits: major permits and administrative permits. Major permits require a public hearing before the commission and a vote by the commission. Smaller projects can obtain an administrative permit issued by the executive director of BCDC and approved on the commission's consent calendar (Aramburu pers. comm.). The permit system is designed to ensure that public access is maximized, the shoreline is developed in an aesthetically pleasing fashion, and that bay shorelines are reserved for those uses "providing substantial public benefit" (Bay Conservation and Development Commission 1988).

The proposed project site is not within the jurisdiction of BCDC because it is located approximately 250 feet from the bayshore tidal salt marsh and is thus greater than 100 feet inland from the highest tidal action. There are, however, several policies within BCDC's *San Francisco Bay Plan* that would be relevant to the project.

BCDC San Francisco Bay Plan. BCDC prepared the *San Francisco Bay Plan* (amended in 1988) that guides shoreline development within BCDC's jurisdiction and development within areas reserved for "priority uses," such as "ports, water-related industry, waterfront recreation, airports, and wildlife areas." The plan also identifies view corridors to the bay from surrounding urbanized hillsides and roadways (Bay Conservation and Development Commission 1988).

The bay shoreline located south of the EPA laboratory project site has not been designated as a location reserved for priority uses under the *San Francisco Bay Plan*. The *San Francisco Bay Plan* section entitled "Other Uses of the Bay and Shoreline" suggests policies to govern shoreline development in areas that are not reserved for priority uses and are not within BCDC's shoreline jurisdiction. These policies are recommended but not required. The following policies, drawn from this section, are relevant to the development of the EPA laboratory.

1. Shore areas not proposed to be reserved for a priority use should be used for any purpose (acceptable to the local government having jurisdiction) that uses the Bay as an asset and in no way affects the Bay adversely. This means any use that does not adversely affect enjoyment of the Bay and its shoreline by residents, employees, and visitors within the site area itself or within adjacent areas of the Bay or shoreline.

6. Power distribution and telephone lines should either be placed underground (or in an attractive combination of underground lines

with streamlined overhead facilities) in any new residential, commercial, public, or view area near the shores of the Bay. (Bay Conservation and Development Commission 1988.)

Several specific plans have been adopted as part of the *San Francisco Bay Plan* to provide more detailed information for certain portions of the shoreline, including the south Richmond shoreline. The South Richmond Shoreline Special Area Plan was adopted in May 1977 to provide more specific guidelines for use of the shoreline in a manner consistent with BCDC's *San Francisco Bay Plan*. Much of this plan has been superseded by the draft Knox Freeway/Cutting Boulevard Corridor Specific Plan (Hall, Goodhue, Haisley, and Barker 1989). This plan has not yet been approved by the City of Richmond and is thus not evaluated in this report.

Richmond Coastline Plan. The *Richmond Coastline Plan* (Waterfront Development Committee 1973) provides policies governing the use of Richmond's shoreline. Much of this plan has been replaced by more recent shoreline plans for Richmond, although some of the policies are still relevant. The objectives of the *Richmond Coastline Plan* include:

- o increasing shoreline access,
- o protecting wetland communities,
- o developing coastline segments in a manner that will provide jobs for Richmond residents,
- o improving Richmond's image through coastline development, and
- o balancing coastline uses (Richmond Waterfront Development Committee 1973).

The following policies in the *Richmond Coastline Plan* apply to the EPA laboratory project site.

> Discourage scattered development of industry. Accommodate non-water-related industries in areas that are already committed to industry, but under-utilized [including the southern shore between South 27th Street and Point Isabel; includes the field station].
>
> Encourage development of a system of hike/bike trails throughout the Coastline Area [includes the university's shoreline property].
>
> Initiate and carry through coordinated planning to provide public access at points along Richmond's southern shoreline, from Point Isabel to and including the Inner Harbor Basin [includes the university's shoreline property].
>
> Strongly support regional efforts to curtail air and water pollution.
>
> Urge the development of public access points and scenic highways described in the Public Access and Scenic Highways elements of this plan in order to make Richmond's open space visible to large numbers of people.

Give highest priority to preserving and enhancing the potential amenities of the coastline's variety of edges and of the landmark character of its adjacent hills.

Wherever possible, in order to conserve the coastline and maximize its availability to all citizens, enforce the following industrial development guidelines:

> Do not permit extensive use of the shoreline for storing raw materials, fuel, or wastes on a long-term basis.
>
> Locate access routes and shoreline structures with their longest dimensions at right angles to the shore.
>
> Encourage local industries to develop their own plans for improving the appearance of their facilities, where possible, and for integrating their properties into the city as a whole. (Richmond Waterfront Development Committee 1973.)

ENVIRONMENTAL CONSEQUENCES

Compatibility with Local Land Uses

The proposed project is compatible with adjacent light industrial land uses, such as Bio Rad Laboratories. The EPA laboratory is partially compatible with heavy industrial land uses, such as ICI's facility west of the field station. However, industrial uses that may potentially emit pollutants (e.g., ICI) could possibly affect the air intake of the EPA laboratory. This impact is expected to be less than significant because the EPA intends to filter the intake air. In addition, the distance between the proposed project and heavy industrial uses will result in some dilution of pollutants.

The proposed project would also be compatible with existing research, office, commercial, and warehouse uses at the field station and adjacent properties; however, it may be incompatible with the Marina Bay residential community currently under construction within 500 feet of the project site. Given that the EPA laboratory is expected to generate few impacts that would affect nearby properties and that Bio Rad Laboratories is within 200 feet of the Marina Bay community, this impact is expected to be less than significant.

Conclusion:

- Impact findings: The project is consistent with adjacent industrial, research, office, commercial, and warehouse land uses. The project is potentially inconsistent with nearby Marina Bay residential community (under construction).

- o Significance: Less than significant.
- o Mitigation measures: None required.

Change in Project Site Land Uses

The proposed project would replace existing storage and research land uses with a laboratory, auxiliary structures, new infrastructure, and paved parking. Approximately 2.5 acres of mowed ruderal field and 20-30 eucalyptus trees would also be replaced by the previously mentioned land uses. The EPA laboratory would be substantially larger than the five buildings currently on the site.

All structures currently on the site would be demolished. Those articles stored in buildings 126 and 131 would be moved to other storage facilities at the field station. Waste Energy Technology is moving out of building 128 into a facility that is not owned by the university. The remaining buildings on the project site (buildings 129 and 200) are vacant.

Conclusion:

- o Impact findings: The project would result in no land use impacts (see Chapter 9 for impacts on biotic resources). Replacement of storage, research, and mowed ruderal field land uses with similar urban land uses would occur.
- o Significance: None.
- o Mitigation measures: None required.

Consistency with University of California's Land Use Plans

The current master plan governing the University of California development does not address the field station, so conformance with this document is not applicable. The draft master plan for the field station is expected to be completed in May 1990. According to State CEQA Guidelines, approval or rejection of the document will be determined by the Regents of the University of California. Since the plan has not been completed, evaluation of the proposed project for consistency with the plan is not possible at this time.

Conclusion:

- o Impact findings: Not identifiable at this time.
- o Significance: Indeterminable at this time.
- o Mitigation measures: 3.1 Assess project consistency with the master plan during environmental review of the master plan, and if project plans have not been finalized, include applicable plan policies and design standards into the project.

Consistency with the Land Use Element of the City of Richmond Concise General Plan

The proposed project is consistent with all the special industry general plan policies except one. The general plan suggests that employee density should "generally" not exceed 10 persons per net site acre. The project proposes 40 employees at buildout on a 3.17-acre site. This would result in a density of 12.6 employees per acre.

Conclusion:

- o Impact findings: There is a minor inconsistency with the Richmond general plan regarding employee density.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Consistency with the City of Richmond Zoning Ordinance

The proposed use, a laboratory, is allowed within the zoning designation for the site (M-S, LI/R & D). The EPA laboratory would probably not require a conditional use permit; however, the Richmond Planning Department would make the final decision on this issue upon receipt of a development application (Kaufman pers. comm.). The university intends to forego the conditional use permit application procedure. The university does intend to comply with the other requirements of the zoning ordinance. The use of hazardous materials in "laboratory amounts" is a permitted use in the M-S, LI/R & D District.

Conclusion:

- o Impact findings: The EPA laboratory is a permitted use within the M-S, LI/R & D District.
- o Significance: None.
- o Mitigation measures: None required.

Consistency with sidewalk, landscaping, and fencing guidelines is not measurable at this time because these details have not been provided by Wareham. The university and Wareham should complete landscape, fencing, and sidewalk guidelines.

Conclusion:

- o Impact findings: Consistency with sidewalk, landscaping, and fencing guidelines is not measurable because of a lack of details.
- o Significance: None assigned.
- o Mitigation measures: 3.2 Ensure compliance with zoning ordinance design guidelines prior to project implementation.

The laboratory is within the maximum allowed building height of 50 feet. The tallest portions of the laboratory are less than 32 feet high. The proposed structures also comply with the minimum 15-foot building setback requirement. At a minimum, the laboratory is 50 feet from Heron Drive and 85 feet from Avocet Way.

Conclusion:

- o Impact findings: The project is consistent with building height and setback requirements.
- o Significance: None.
- o Mitigation measures: None required.

Consistency with the Shoreline Conservation and Development Strategy

The proposed project is basically consistent with the recommendations and policies of the SCDS, which includes the proposed development of a university research park and a park at the south terminus of south 47th Street, two projects that would affect the field station. Some of the urban design policies suggested for improving the streetscape may be slightly inconsistent with improvements proposed for the EPA laboratory because the existing laboratory site plan shows no streetscape plans.

The SCDS requires that landscaping and open space amount to 10 or 15 percent of the gross land area, depending on land use, including at least 5 percent for usable open space. Since the site plan prepared by Wareham does not indicate landscaping features, a determination of the extent of landscaping is not possible at this time.

Conclusion:

- o Impact findings: Consistency determination for SCDS landscaping requirements is not possible because of a lack of details.
- o Significance: None assigned.
- o Mitigation measures: 3.3 Ensure compliance with SCDS landscaping requirements.

The EPA laboratory would be constructed within several hundred feet of the shoreline. It is not expected to block shoreline pedestrian access because Heron Drive would be a public street. The EPA laboratory project is consistent with the SCDS goal of encouraging shoreline access through the university. It is also consistent with the establishment of a new park at the southern terminus of South 47th Street, as recommended in the SCDS.

Conclusion:

- o Impact findings: No impact. The project would be consistent with the plans to provide expanded shoreline access and a new park at South 47th Street.
- o Significance: None.
- o Mitigation measures: None required.

Consistency with the San Francisco Bay Conservation and Development Commission's *San Francisco Bay Plan*

Conclusion:

- o Impact findings: The project would be consistent with those policies identified in "Other Uses of the Bay and Shoreline" in the *San Francisco Bay Plan*.
- o Significance: None.
- o Mitigation measures: None required.

Consistency with the Richmond Coastline Plan

The EPA laboratory is basically consistent with the *Richmond Coastline Plan* except for a few small discrepancies. The coastline plan calls for locating shoreline structures with their longest dimensions at right angles to the shore in order to increase shoreline views. The EPA laboratory has been planned with its longest dimension (281 feet) parallel to the shore and thus blocks more shoreline view. This impact is considered relatively insignificant because the building would be blocking the views from laboratories, workshops, and offices that are currently obstructed by eucalyptus trees and buildings.

Conclusion:

- o Impact findings: The project would block bayshore views from nearby offices, laboratories, and workshops.
- o Significance: Less than significant.
- o Mitigation measures: None required.

As previously stated, the EPA laboratory would be constructed within several hundred feet of the shoreline and is not expected to prohibit shoreline access. The EPA laboratory project is consistent with the *Richmond Coastline Plan* policies that encourage shoreline access through the university.

Conclusion:

- o Impact findings: The project is consistent with the plans to provide expanded shoreline access.
- o Significance: None.
- o Mitigation measures: None required.

MITIGATION MEASURES

The following recommendations are suggested to alleviate potential impacts of the project. Implementation of the mitigation measures would be the responsibility of the University of California.

3.1 Assess Project Consistency with the Master Plan During Environmental Review of the Master Plan, and If Project Plans Have Not Been Finalized, Include Applicable Plan Policies and Design Standards into the Project

The environmental review of the field station master plan under CEQA (presumably preparation of an EIR) should address consistency of the proposed EPA laboratory with

the master plan. If the project is found to be inconsistent with the master plan, include applicable master plan policies and design standards into the project, provided project plans have not been completed.

3.2 Ensure Compliance with Zoning Ordinance Design Guidelines Prior to Project Implementation

The EPA laboratory should comply with the landscaping, fencing, and sidewalk design guidelines provided in the zoning ordinance prior to project implementation. The zoning ordinance for the Special Industrial District is located in Appendix A of this report.

3.3 Ensure Compliance with Shoreline Conservation and Development Plan Landscaping Requirements.

The EPA laboratory should comply with the following SCDS landscaping requirements:

- Landscaping and open space should amount to 10-15 percent of the gross land area.
- Five percent of the landscaped area should be devoted to open space.

Given these recommendations, the project should include approximately 16,000-24,000 square feet of open space with approximately 8,100 square feet devoted to usable open space.

CHAPTER 4. Public Facilities and Services

AFFECTED ENVIRONMENT

Water

Supply and Infrastructure

Water service at the field station is provided by the East Bay Municipal Utility District (EBMUD). EBMUD delivers treated water to all of western Contra Costa County, and is examining ways to increase its water supply over the next 10 years.

EBMUD currently serves the field station with two 8-inch water lines from the north and east (Figure 4-1). The 8-inch line from the east follows the Plover Drive alignment and serves most of the project site. The 8-inch from the north serves the Northern Regional Library Facility and extends from a 12-inch line that parallels Regatta Boulevard. A 4-inch water line crosses the western edge of the project site, but it is not large enough to provide the water pressure needed for this project. This 4-inch line, as with many other lines on the field station, is old and potentially in need of upgrading. A third 8-inch water line that terminates on the west side of the field station on the Price Club property is potentially available for use by the university.

Wastewater

Treatment and Disposal

The Richmond Municipal Sewer District, one of three districts serving Richmond, provides wastewater treatment and disposal services for the field station. Wastewater from the field station is transported through two trunk sewer lines, one located along the northern border of the field station and the other along the southern border (Figure 4-2). Wastewater is directed to the Richmond Wastewater Treatment Plant for primary and secondary treatment. The treatment plant is located approximately 3 miles west of the project site on Canal Boulevard. Once wastewater is treated, it is discharged into the San Francisco Bay.

Demand and Capacity

The Richmond Municipal Sewer District, receives an average of 6 million gallons per day (MGD) during the dry season. The treatment plant has a design capacity of 16 MGD;

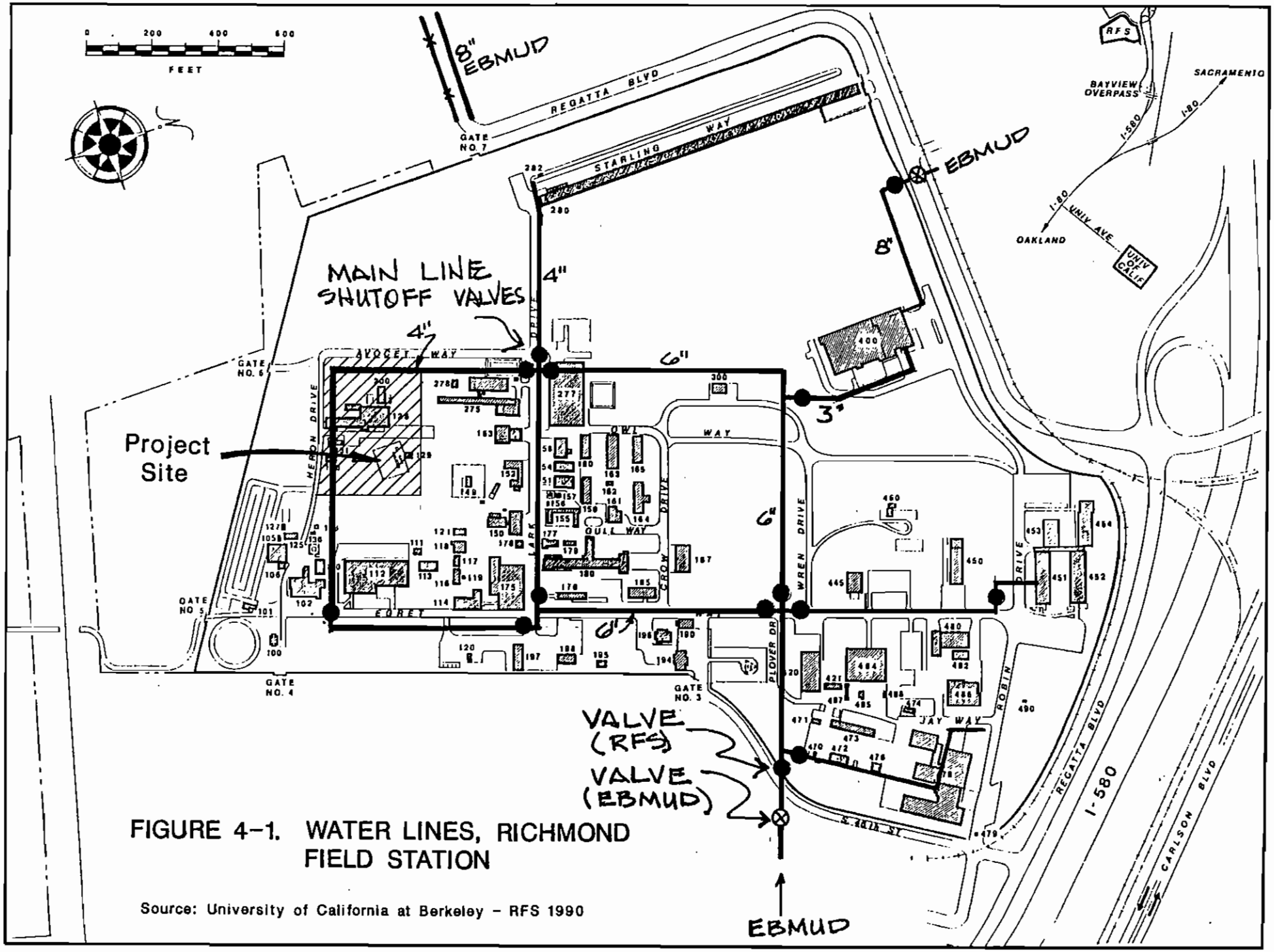


FIGURE 4-1. WATER LINES, RICHMOND FIELD STATION

Source: University of California at Berkeley - RFS 1990

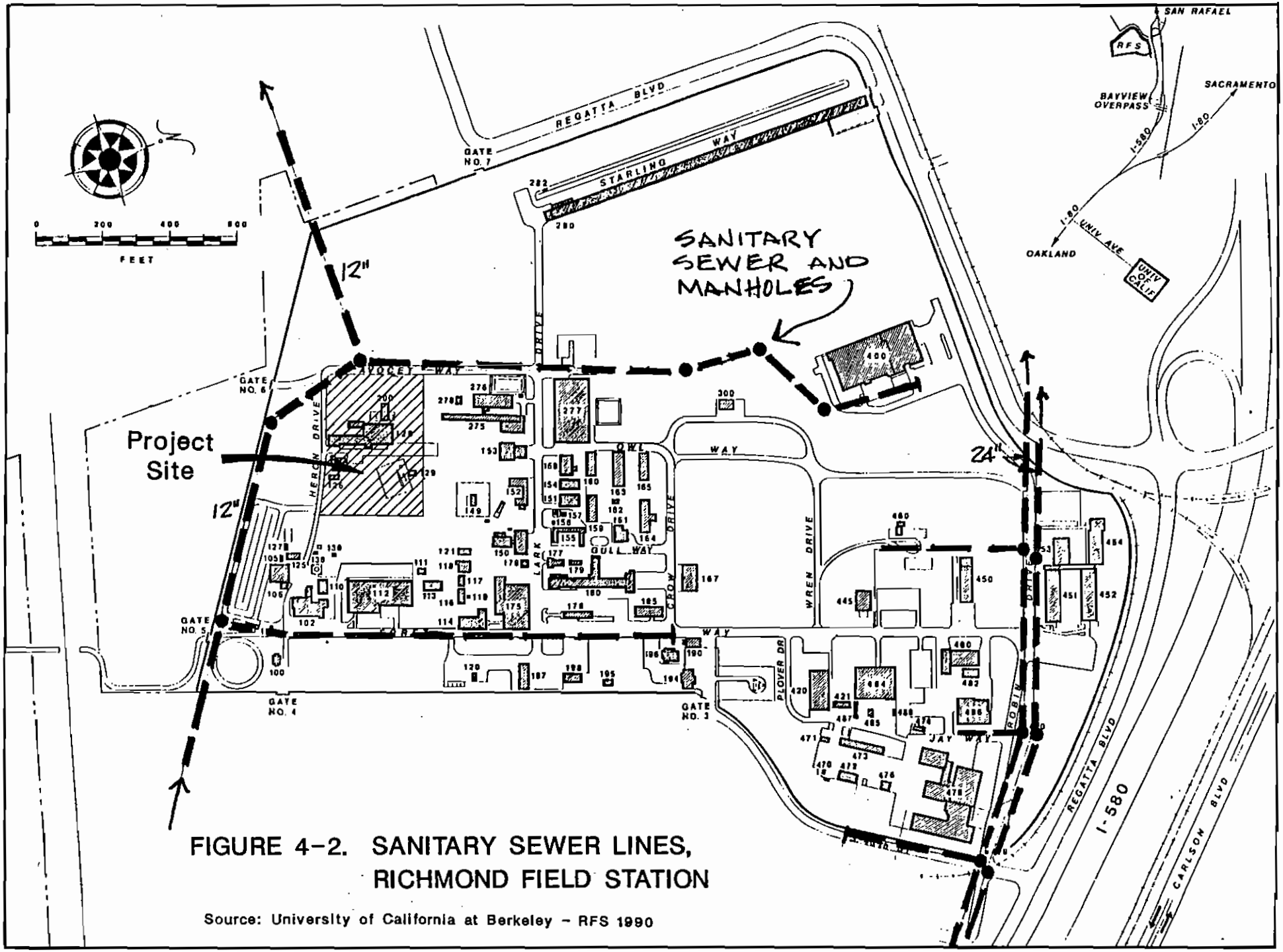


FIGURE 4-2. SANITARY SEWER LINES, RICHMOND FIELD STATION

Source: University of California at Berkeley - RFS 1990

however, during heavy storms the plant can process up to 40 MGD since water received through storm drainage receives only primary treatment. Stormwater can accidentally enter the sanitary sewer system through fractured sanitary sewer lines and illegal hookups, which results in increased treatment demand. The plant has a capacity problem only during exceptionally heavy storm periods (Linslay pers. comm).

Sanitary Sewer Line

The 12-inch sanitary sewer line located along the southern border of the field station would serve the proposed EPA laboratory (Figure 4-2). This line, which serves other shoreline land uses, has a capacity problem resulting from several situations. First, the sewer line has a slight uphill gradient. (Linslay pers. comm.).

Second, the line is located along the shoreline where the groundwater level is higher. Since the line is located at depths of 8-10 feet above sea level in an area where the water table fluctuates between 5 and 10 feet above sea level (depending on tides and rainfall), winter storms are capable of filling the line to capacity when the pressure outside the line is greater than the pressure in the line (i.e., when the groundwater level rises). (Linslay pers. comm.).

Third, surface drainage that should be connected to the storm drain system is actually connected to the wastewater system. These connections were made before the storm drainage and wastewater systems were separated many years ago. Flows from these storm drainage connections surcharge the sewer system during storm events. (Linslay pers. comm.).

Finally, iron oxide (rust) is building up in the sewer line which acts to decrease the line's capacity. The iron oxide is originating from contaminated groundwater infiltration at ICI Americas. The groundwater has been contaminated with metals from years of industrial uses on the site. To reduce the acidity of this metal-pervaded groundwater (once it has entered the sanitary sewer system), a basic or nonacidic chemical, such as sodium hydroxide, is added to ICI Americas' wastewater. The sodium hydroxide causes the iron to precipitate out of the water in the form of iron oxide. The iron oxide builds up on the inside of the sewer line, which in turn reduces the line's capacity. (Linslay pers. comm.).

The Richmond Municipal Sewer District recently installed a new pump near Marina Bay to increase the flow through the pipe and force the wastewater through the portion of the pipeline with an uphill gradient. The pump has solved the capacity problem with the exception of infiltration discovered on ICI Americas' property. (Linslay pers. comm.).

Based on testing performed by the Richmond Municipal Sewer District, much of the groundwater infiltration appears to be originating in the portion of the pipeline crossing ICI America's property. To mitigate this problem, ICI America installed a "slip line" or a plastic sleeve into the sewer line. However, groundwater is still penetrating the system by flowing between the slipline and the sewer line. ICI Americas is considering remedial action for the infiltration. (Linslay pers. comm.).

The amount of infiltration occurring at the field station is not known; however, it is expected to be relatively small based on testing performed by the Richmond Municipal Sewer District. Wastewater samples from the sewer line taken at the field station and at ICI America were tested for the presence of metals, which implies contaminated groundwater infiltration. The wastewater appeared to have diluted concentrations of metals as it passed through the field station, which indicated that additional groundwater (from the field station) had not infiltrated the system and that the field station's wastewater was diluting upstream wastewater. (Linslay pers. comm.).

Sewer line infiltration implies that exfiltration (i.e., wastewater flowing out of the sewer line when the pressure inside the line is greater than the pressure outside the line) may also be occurring. Since the sewer line is close to the bay shoreline, wastewater escaping the sewer line could enter the bay with little filtration. The extent of infiltration is not known at this time.

Acid Waste Neutralization

The proposed EPA laboratory includes an acid waste pretreatment neutralization program. All waste acids would be segregated into a separate drain system for collection and neutralization. Following this pretreatment process, neutralized acid wastes would be conveyed to the Richmond Municipal Sewage Treatment Facility along with other wastewater (Husby, Johnson pers. comms.).

Storm Drainage and Flooding

Storm Drainage

Stormwater runoff flows from north to south at the field station by way of open drainage ditches, culverts, and sheet flow into drainages (Figure 4-3). Runoff water is eventually discharged into San Francisco Bay, which forms the southern border of the field station.

Runoff from half of the project site drains into a ditch and culvert system and the other half drains as surface flow and eventually enters the groundwater. Surface water on the west side of the project site flows into one of two open ditches that direct water to the bay. The eastern half of the site drains into the southeastern corner of the project site where it enters a small swale bordering Heron Drive (Figure 4-3). A small pipe underneath Heron Drive connects this swale with another small swale south of Heron Drive. As runoff drains under Heron Drive and into the swale it is absorbed into the groundwater system.

Flooding

According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (Federal Emergency Management Agency 1979) for the southern shore of Richmond, the 100-year flood zone extends to the 6-foot contour above mean high tide. This is immediately south of the south terminus of South 32nd and South 49th Streets.

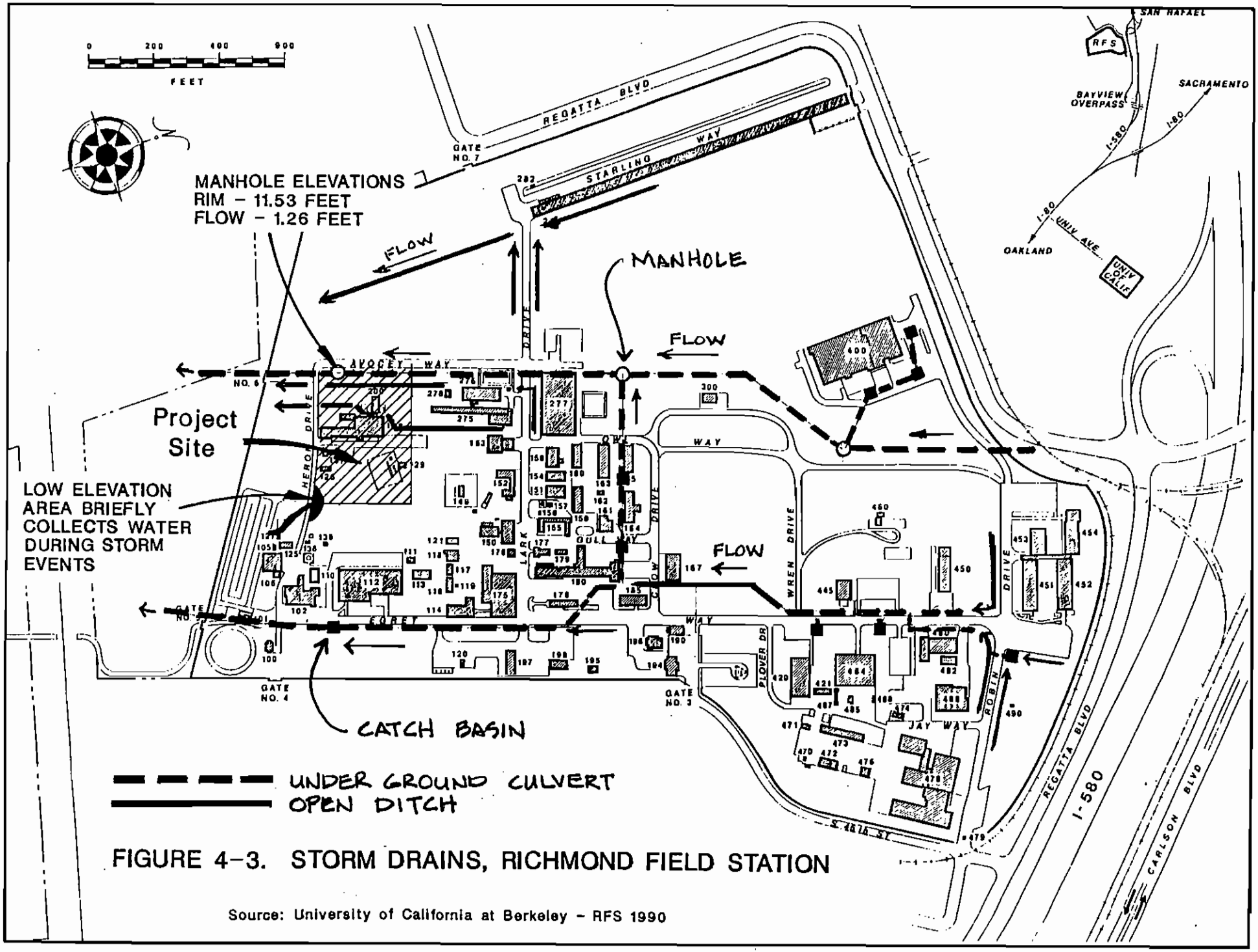


FIGURE 4–3. STORM DRAINS, RICHMOND FIELD STATION

Source: University of California at Berkeley – RFS 1990

The south side of Heron Drive appears to be at an elevation of 6 feet and would be expected to occasionally flood, according to the flood map. The flood zone also extends upstream along Meeker Ditch, which carries water near sea level when it's near the shoreline. The project site is not within the 100-year flood zone identified by the FEMA; however, the project site has been subject to flooding on at least one occasion.

In 1982, the combination of an extremely high tide and a 65-year storm event resulted in flooding over a large part of the field station. The extreme high tide rendered the field station's drainage ditches and culverts useless because tidal waters filled them to capacity. The stormwaters had no means of leaving the site except through the groundwater system, but the groundwater level had risen within several feet of the ground surface due to the heavy rains. Most of the floodwaters retreated into the drainage system at low tide (Kuykendall pers. comm., Rutherford & Chekene 1989).

It has been estimated, but with great uncertainty, that sea levels will rise 2-8 feet in the next 100 years due to the "greenhouse" effect. Because of the large margin of error in this estimate, the EPA has suggested using an estimate of a 4-foot rise in the sea level. Such a rise would subject large areas of the field station (including the project site) to frequent flooding unless dikes or levees are built to protect those areas (Rutherford & Chekene 1989).

Solid Waste

Nonhazardous solid waste would be disposed of by the University of California as part of its existing program to remove solid waste from the field station. Solid waste is taken to the West Contra Costa Sanitary Landfill, which is owned and operated by a private company, Richmond Sanitary Services, the franchise hauler for the west Contra Costa area. Richmond Sanitary Services also collects and recycles reusable materials. The landfill receives 670 tons of waste material per day (Tuohy pers. comm.). The landfill is equipped to handle class III wastes (standard municipal wastes), as well as asbestos and treated infectious wastes.

The West Contra Costa Sanitary Landfill is one of two open landfills in the county. It is expected to reach capacity in 1992 and the second site, located in Martinez, is expected to close soon. In response to the impending closure of Contra Costa County's landfills, the county prepared a solid waste management plan. The plan indicated that existing landfills could accommodate the county's waste stream for only 2 more years, and that it would take 3 years to place a new landfill into operation. The plan also identifies five potential landfill sites. An environmental impact report was prepared on the plan, which was approved (after revisions) in December 1989. Two Draft EIRs have been prepared for two of the five proposed landfill sites. The two landfills would serve the county for at least 30 years (Valone pers. comm.). Since Contra Costa County does not expect to have the new landfills in operation before closure of existing landfills, the County has made an agreement with Alameda County to provide temporary solid waste disposal.

Fire Protection

The Richmond Fire Department provides fire fighting, fire prevention, and emergency response services for the field station. The City of Richmond has seven fire stations. Fire station number 64 is first to respond to an emergency at the field station. It is located less than 1 mile northwest of the field station (Figure 4-4). The station is staffed with three full-time fire fighters and a single 1,500-gallon pumper. Response time to the Richmond Field Station is less than 3 minutes (Howard pers. comm.).

In the event of a first alarm structural fire, the Richmond Fire Department would dispatch three 1,500-gallon pumpers and one engine with aerial equipment (extension ladder). One pumper and the engine with aerial equipment would be dispatched from station number 67 and a second engine would be routed from station number 66 (Howard pers. comm.).

Both the Richmond Fire Department and the Richmond Police Department would respond to emergencies in the vicinity of the project site. The University of California would also dispatch a representative to the scene. The fire department typically acts as the lead agency for most emergency situations. The Richmond Police Department plays a secondary role that may include traffic direction and crowd control.

Fire Flow Requirements

The 4-inch water line currently serving the project site is not capable of providing the pressure needed to fight fires since it is small and located at the end of the water system. Construction of the research library north of the proposed project site included a new 8-inch fire main to service the building because of the lack of adequate pressure. This 8-inch line feeds off the 12-inch water line that parallels the north border of the field station (Bell pers. comm.). The EPA laboratory would likely require an 8-inch water line to provide the water pressure needed to fight a fire.

Fire Hazard in the Site Vicinity

David Howard, the fire marshal for the Richmond Fire Department, has said that other than the Safeway fire in July 1988, no other emergency situations have occurred in the vicinity of the field station over the past several years. The Safeway fire destroyed the main warehouse building used by the grocery chain, which covered 13.5 acres. The fire may have started from the faulty wiring of a light fixture. Other than this incident, no other significant emergency situations have occurred near the field station (Howard pers. comm.).

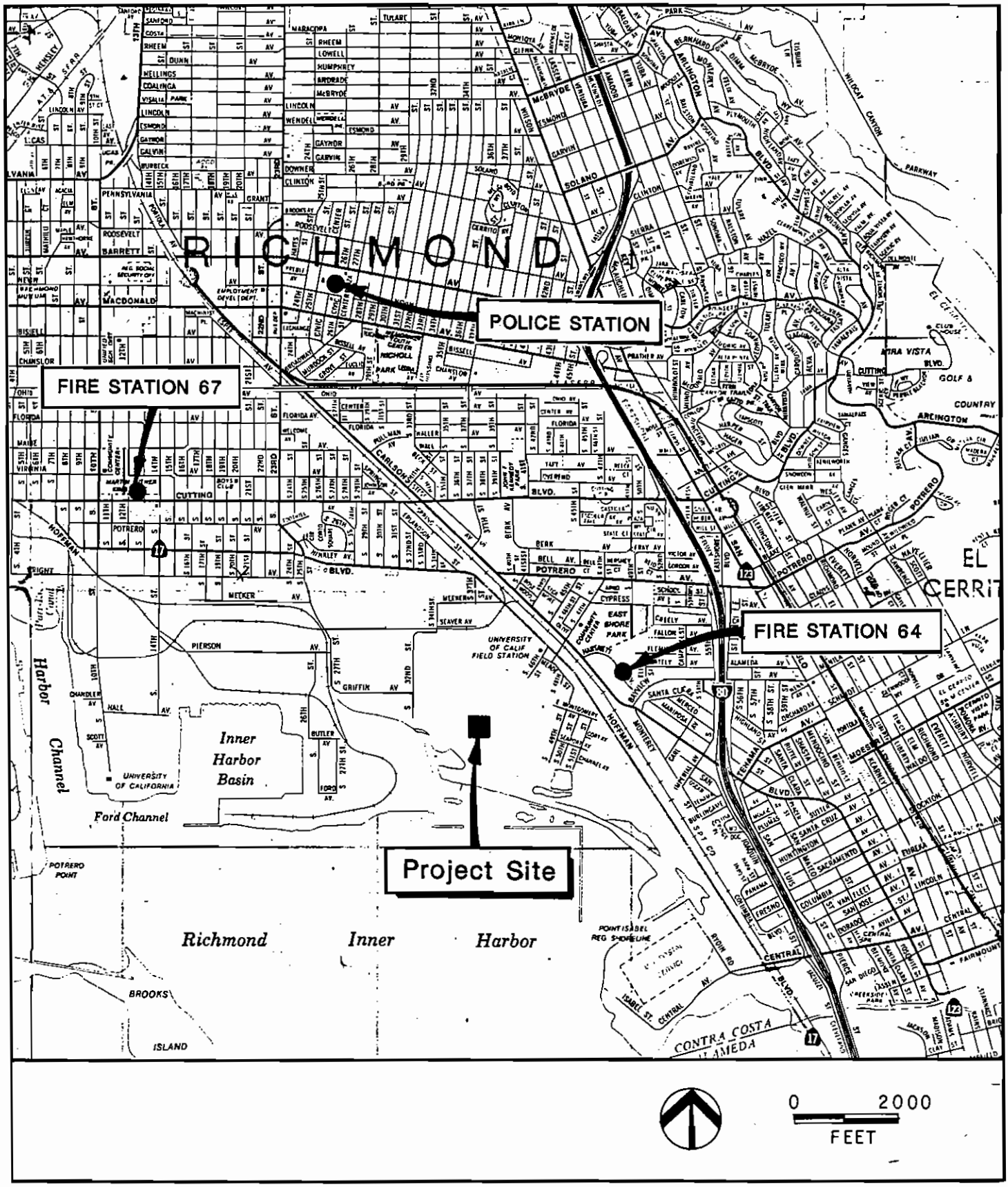


FIGURE 4-4. LOCATIONS OF NEARBY RICHMOND FIRE STATIONS AND THE RICHMOND POLICE STATION

Police Services

The University of California is responsible for providing police protection at the field station. Police service by the Richmond Police Department is available in emergency situations.

The university police department, headquartered at the University of California, Berkeley, has one officer keep patrolling the field station 24 hours per day. The field station is fenced and gated, which limits access. A kiosk at the entrance is manned during working hours Monday through Friday. The field station is accessible at other times via Gate Number 3 at the south end of South 46th Street. This gate is controlled by the university police department, and a police station is located at the gate in building 190. Entrance to the field station is restricted to authorized persons.

The City of Richmond has one central police station located in the civic center on Barrett Avenue (Figure 4-4). Emergency response time to the field station is 2-5 minutes depending on the location of the patrolling officer.

The crime rate per 1,000 inhabitants is typically twice as high in Richmond as compared to other California cities (Hall, Goodhue, Haisley, and Barker 1986); however, the industrial portions of Richmond typically have a lower crime rate than the residential areas. Criminal incidents are few at the field station. The field station has had fewer than five burglaries over the past 6 years (Kuykendall pers. comm.).

Electrical Service

The Pacific Gas and Electric Company (PG&E) provides electricity to the field station. A 12-kilovolt (kV) electrical line provides electricity to the field station and traverses the project site in an east-west direction (Figure 4-5). The electrical service includes both underground cables and aerial power lines. A transformer on this line (located on the project site between buildings 128 and 129) contains PCBs. This transformer will be removed before September 1990.

The field station is monitored by one electric meter. The proposed laboratory would be monitored by a separate meter (Bell pers. comm.). PG&E does not have a capacity problem regarding service to the City of Richmond or to the field station (Cranston pers. comm.).

Natural Gas Service

PG&E also provides natural gas service to the field station through a high-pressure gas main on South 46th Street. An existing gas line traverses the project site (Figure 4-6). Four gas meters at the field station monitor natural gas use. The EPA laboratory would be metered separately from the field station (Bell pers. comm.). PG&E does not have a

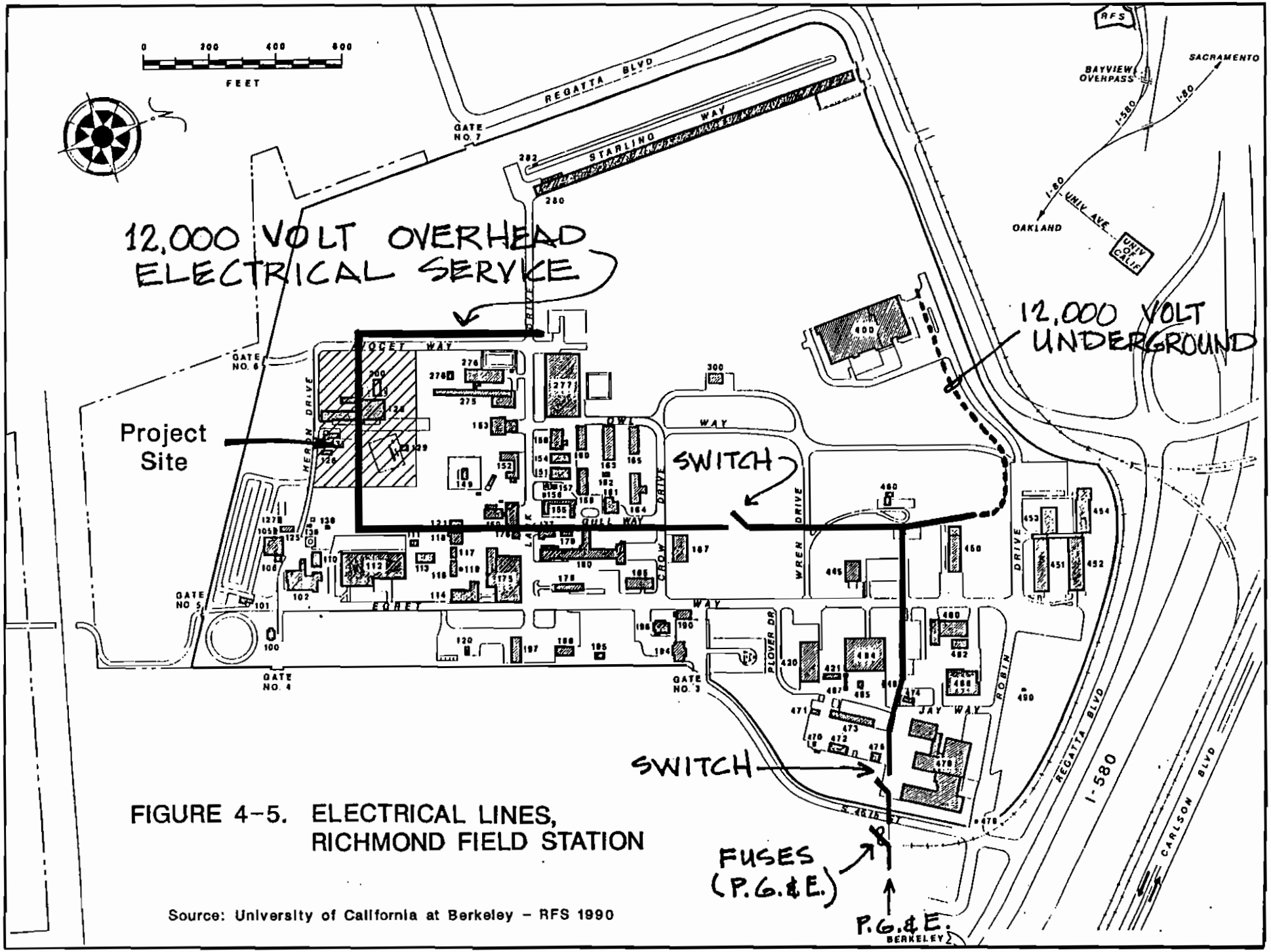


FIGURE 4-5. ELECTRICAL LINES, RICHMOND FIELD STATION

Source: University of California at Berkeley – RFS 1990

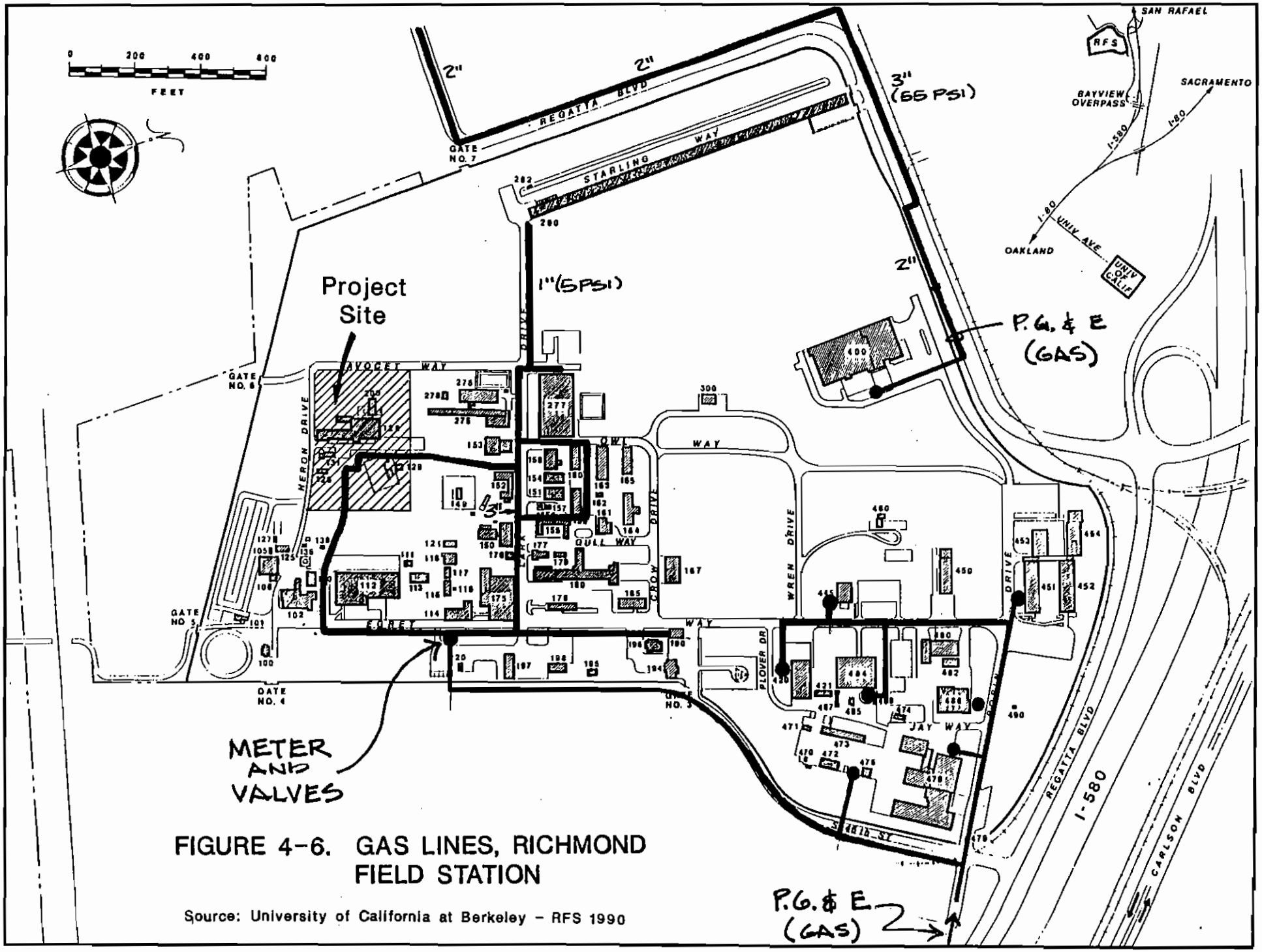


FIGURE 4-6. GAS LINES, RICHMOND FIELD STATION

Source: University of California at Berkeley – RFS 1990

capacity problem regarding service provision to the City of Richmond or to the Richmond Field Station (Cranston pers. comm.).

ENVIRONMENTAL CONSEQUENCES

Water

Increased Water Consumption

Operation of the EPA laboratory would require approximately 2,000 gallons of water per day. This would result in an increase in water consumption at the field station of approximately 3 percent. This impact is considered less than significant since it represents a small proportion of water demand as compared to the total demand of EBMUD's service district, since there are no problems with water supply in west Contra Costa County.

Conclusion:

- o Impact finding: The project would consume approximately 2,000 gallons per day.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Possible Inadequate Infrastructure

The proposed project is located in the central pressure zone of EBMUD's service area. Some of the waterlines in this area are old and need to be renovated (McCowan pers. comm.). The existing lines also need upgrading to provide adequate water pressure for the proposed EPA laboratory. This impact is considered less than significant.

Conclusion:

- o Impact finding: Existing waterlines do not have adequate water pressure to serve the project and may be in a state of decay, and thus may not be able to serve the project in their current state.
- o Significance: Less than significant.
- o Mitigation measures: 4.1 Evaluate water service infrastructure and project demand to determine if waterline renovation is necessary, and if so, make the necessary improvements.

Wastewater

Increased Wastewater Generation

The proposed laboratory would generate approximately 1,600 gallons of wastewater per day. This impact is considered less than significant since it represents a small proportion of wastewater generation in the Richmond Municipal Sewer District.

Conclusion:

- o Impact finding: The laboratory would generate approximately 1,600 gallons of wastewater per day.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Possible Inadequate Infrastructure

The proposed project site would be served by the 12-inch sewer line that follows the southern boundary of the field station. This line could have a capacity problem during extended storm periods due to infiltration of groundwater into the trunk line; however, the problem is expected to be less than significant (Linslay pers. comm.). The line could handle wastewater generated by the EPA laboratory throughout most of the year. The university should work with the Richmond Municipal Sewer District to develop a solution to the storm-induced capacity problem.

Conclusion:

- o Impact finding: The sewer line serving the site could have a capacity problem during storm events.
- o Significance: Less than significant.
- o Mitigation measures: 4.2 Investigate the need to upgrade and expand the onsite sanitary sewer system, and, if needed, implement measures to increase the sanitary sewer trunk line's capacity.

Storm Drainage and Flooding

Increased Surface Runoff

According to the site plan for the EPA laboratory, runoff would be directed into roughly 14 catch basins and four drainage inlets. Although details were not provided, it is

assumed that this water would be released into the bay. About 50 or 60 percent of the site (approximately 1.5 acres) currently supports penetrable ruderal grassland. These areas would be replaced with impermeable surfaces (i.e., asphalt parking, concrete sidewalks, and buildings). Most of the 3.17-acre project site would be covered with impermeable surfaces following project implementation. This would increase water runoff directly entering San Francisco Bay. This impact is considered potentially significant given the limited history of flooding at the field station. Additional runoff would aggravate clearance of stormwater if a storm similar to the 1982 storm coincided with an extreme high tide. The chances of this situation occurring again in the expected lifetime of the EPA laboratory are remote but possible. In addition, if the sea level continues to rise because of the greenhouse effect, as suggested by EPA studies, the potential for the project site to flood would increase.

The EPA, the university, and the developer should ensure that the indoor portions of the laboratory are elevated above potential flood levels that could result from heavy rains and extreme high tides. Structures should be designed to withstand the forecasted level and frequency of flooding. Chemical storage should be elevated above forecasted flood levels. In addition, the university should determine the available capacity of the field station's storm drainage system at the highest high tide. The university in coordination with the Richmond Public Works Department, should determine how much additional capacity would be needed to prevent flooding of the laboratory project site during storm events. This information should be used to determine the risk of flooding on the project site. If the risk is considered high, the university should implement measures to reduce the potential for flooding to an acceptable risk level.

Conclusion:

- o Impact finding: Implementation of the project would increase water runoff, which could aggravate the potential for onsite flooding.
- o Significance: Potentially significant.
- o Mitigation measures: 4.3 Ensure the project's indoor areas are above potential future flood levels, determine the risk of site flooding, and reduce this risk to an acceptable level, if deemed necessary.

Disruption of Existing Drainage System

Offsite runoff from portions of the field station north of the project site are currently channeled into drainages crossing the west side of the site. Implementation of the proposed project would result in the rerouting of runoff that flows through the culverts and open drainage ditches on the site. Thus, construction of the EPA laboratory would result in the disruption of the existing storm drainage system. This impact is considered less than significant.

Conclusion:

- o Impact finding: Implementation of the project would result in the disruption of the existing storm drainage system.
- o Significance: Less than significant.
- o Mitigation measures: 4.4 Reroute surface drainage from properties adjacent to drainages off the project site. 4.5 Implement a drainage plan for the EPA laboratory site.

Solid Waste Disposal

Increased Solid Waste Generation

The proposed EPA laboratory would generate approximately 75 pounds of solid waste per day during operation. This is equivalent to 10 percent of the existing solid waste generated at the field station and 0.01 percent of the total solid waste received at the West Contra Costa Sanitary Landfill each day. This impact is considered less than significant given the comparatively small amount of waste generation.

Conclusion:

- o Impact finding: Operation of the laboratory would generate roughly 75 pounds of solid waste per day.
- o Significance: Less than significant.
- o Mitigation measures: 4.6 Continue to evaluate potential landfill sites. 4.7 Establish a recycling program at the EPA laboratory and the field station.

Fire Protection

Increased Need for Fire Protection

The proposed EPA laboratory could require the service of the Richmond Fire Department in the event of an emergency. The addition of the EPA laboratory is not expected to have a significant impact on the capacity of the Richmond Fire Department. The fire department has requested however, that the EPA prepare an "environmental compliance plan" (also known as a business plan) that would address use of hazardous materials at the laboratory. This plan would assist the fire department in determining the level of impact the project would have.

The primary public safety concerns are the potential for a fire at the laboratory to involve chemicals or chemical spill at the facility. These concerns are compounded by low water pressure in the vicinity of the proposed project, which decreases fire fighting capabilities for fires that would be managed with water. In addition, the wooden structures at the field station increase the fire hazard in the area, but Fire Marshal Howard conceded that the threat of fire spreading from adjacent facilities is not great. Existing buildings are used for research activities that may include the use of flammable or combustible chemicals and gases. The field station buildings have fire alarm systems but they do not have sprinkler systems.

The fire department is interested in reducing potential fire hazards at the laboratory through the use of site design techniques, including improvement of onsite water pressure, provision of at least two access points to the site, installation of sprinklers in the building, and preparation of a business plan. (Howard pers. comm.).

Conclusion:

- o Impact finding: The EPA laboratory would require the services of the Richmond Fire Department.
- o Significance: Less than significant.
- o Mitigation measures: 4.8 Implement the mitigation measures suggested by the Richmond Fire Department and required by the EPA. 4.9 Prepare a business plan for the laboratory.

Insufficient Fire Fighting Water Pressure

The minimum amount of pressure needed to adequately fight a fire at the site is 1,500 gallons per minute. The existing 4-inch line that serves that site is insufficient to provide the minimum amount of water pressure needed or required to fight a fire at the site (Howard pers. comm). The waterline should be upgraded, as necessary, to provide adequate water pressure for fire fighting.

Conclusion:

- o Impact finding: Existing water pressure at the site is not sufficient to adequately fight a fire.
- o Significance: Less than significant.
- o Mitigation measures: 4.10 Upgrade the existing waterline (as needed) to supply adequate water pressure for fire fighting.

Police Services

Increased Need for Police Protection

The proposed EPA laboratory may occasionally require the services of the Richmond Police Department in the event of an emergency. If the university and the EPA implement measures to increase safety at the laboratory, the need for police services is expected to be minimal.

Conclusion:

- Impact finding: The laboratory would require the services of the Richmond Police Department.
- Significance: Less than significant.
- Mitigation measures: 4.11 Install a security system. 4.12 Maintain security provided by the university.

Electrical Service

Increased Electrical Demand

The proposed EPA laboratory would use an unknown amount of electricity. However, PG&E expects that service provision to the laboratory will be workable given available information on the size of the project. PG&E does not expect operation of the EPA laboratory to have a significant impact on PG&E's ability to serve the area (Cranston pers. comm.).

Conclusion:

- Impact finding: Operation of the laboratory would require an unknown amount of electricity.
- Significance: Less than significant.
- Mitigation measures: None required.

Disruption of Existing Electrical System

Implementation of the proposed EPA laboratory would require rerouting the existing 12-kV electrical lines that cross the middle of the site in a northwest-southeast direction. The university intends to underground and reroute utilities as part of the project. The transformer containing PCBs will be removed from the project site prior to project implementation.

Conclusion:

- o Impact finding: Implementation of the project would require disruption and relocation of existing electrical lines crossing the site.
- o Significance: Less than significant.
- o Mitigation measures: 4.13 Reroute and underground utilities that cross the site, as proposed in the project description.

Natural Gas Service

Increased Natural Gas Demand

The proposed EPA laboratory would use an unknown amount of natural gas. However, PG&E expects that service provision to the laboratory will be workable given available information on the size of the project. PG&E does not expect operation of the EPA laboratory to have a significant impact on PG&E's ability to serve the area (Cranston pers. comm.).

Conclusion:

- o Impact finding: Operation of the laboratory would require an unknown amount of natural gas.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Disruption of Existing Natural Gas Delivery System

Implementation of the proposed EPA laboratory may require rerouting the existing natural gas line that crosses the middle of the site in a northeast-southwest direction. The university intends to underground utilities as part of the project. This impact is considered less than significant.

Conclusion:

- o Impact finding: Implementation of the project may require rerouting of an existing gas line.
- o Significance: Less than significant.

- Mitigation measures: 4.14 Work with PG&E to identify and implement a suitable alignment for rerouting the gas line crossing the site, if necessary.

MITIGATION MEASURES

4.1 Evaluate Water Service Infrastructure and Project Demand to Determine if Waterline Renovation Is Necessary, and if so, Make the Necessary Improvements

The university, along with EBMUD, should evaluate the capacity of the existing waterlines and the water demand of the proposed project to determine the amount of upgrading needed. The 4-inch water line serving the project site would probably require upgrading to meet fire flow requirements and increased water demand stemming from this project, as well as the remainder of the proposed research center. If it is determined that upgrading of the waterline is necessary, the university should implement measures to improve the water delivery system.

4.2 Investigate the Need to Upgrade and Expand the Onsite Sanitary Sewer System and, if Needed, Implement Measures to Increase the Sanitary Sewer Trunk Line's Capacity

The available sewer line capacity during storm events should be compared to the amount of wastewater expected to be generated by the EPA laboratory to determine if the sewer line has adequate capacity to serve the project throughout the year. The university should work with the Richmond Municipal Sewer District to address this potential capacity problem. The university should implement measures as needed to increase the sanitary sewer trunk line's capacity. For example, a plastic slip line could be inserted into the sewer line to reduce groundwater infiltration. This measure is currently being implemented by ICI to decrease leakage of wastewater from their sewer line into the environment.

4.3 Ensure the Project's Indoor Areas Are Above Potential Future Flood Levels, Determine the Risk of Site Flooding, and Reduce This Risk to an Acceptable Level, If Deemed Necessary

The EPA, the University of California, and the project developer should ensure that the indoor portions of the laboratory are elevated above potential flood levels resulting from heavy rains and extreme high tides. Structures should be designed to withstand the forecasted level and frequency of flooding. Chemical storage should be elevated above forecasted flood levels. In addition, the university should determine the available capacity of the field station's storm drainage system at the highest high tide. The university, in coordination with the Richmond Public Works Department, should determine how much additional capacity would be needed to prevent flooding of the laboratory project site during storm events. This information should be used to determine the risk of flooding on the project site. If the risk is considered high, the university should implement measures to reduce the potential for flooding to an acceptable risk level.

4.4 Reroute Surface Drainage From Properties Adjacent to the Project Site to Drainages Off the Project Site

Surface runoff carried by the swales and culverts crossing the project site should be redirected to other drainages, such as the culvert that parallels Avocet Way.

4.5 Implement a Drainage Plan for the EPA Laboratory

To manage runoff on the project site, the university should implement a drainage plan for the project site. The university appears to be planning the site drainage as evidenced by the depiction of catch basins and drainage inlets on the laboratory site plan. However, additional details of the site drainage plan are unavailable at this time.

4.6 Continue to Evaluate Potential Landfill Sites

Contra Costa County should continue to evaluate potential landfill sites.

4.7 Establish a Recycling Program at the EPA Laboratory and the Field Station

The EPA should implement a recycling program which would consist of non-contaminated glass and paper recycling. Collection could be provided by the Richmond Sanitary Service. The University of California should consider a recycling program for the entire field station, which would include the proposed research center. This mitigation measure would not reduce the impact to a less-than-significant level.

4.8 Implement the Mitigation Measures Suggested by the Richmond Fire Department and Required by the EPA

The potential for health and safety risks to humans from fire will be mitigated by the following design features which have been requested by the EPA.

- Both buildings would be sprinklered. The sprinkler systems would be hydraulically designed to meet National Fire Protection Association Flammable and Combustible Liquid Code (NFPA) 13, local authority standards and recommendations. The system would be approved by a nationally recognized insurance company [EPA 1988, Section 7.19.7]. Fire protection for all laboratory rooms, computer rooms, and core telecommunications closets would be provided through a dual sensing pre-action dry pipe sprinkler system which would be controlled by a deluge valve [U. S. Environmental Protection Agency 1988, Section 7.19.5].

- Smoke alarms would be installed in the buildings [U. S. Environmental Protection Agency 1988, Section 7.19.5].

- Manual fire alarms would be installed along the normal exit paths. The alarm signal would automatically be sent to the Richmond fire department in accordance with NFPA Standard 72B or 72C [U. S. Environmental Protection Agency 1988, Section 8.8].

- Fire doors that are normally held open by electromagnetic devices would be released automatically at the sound of the alarm [U. S. Environmental Protection Agency 1988, Section 8.8].

- Portable fire extinguishers would be located in areas of high fire hazard [U. S. Environmental Protection Agency 1988, Section 5.19.1].

- The buildings would be constructed of permanent, non-combustible construction [U. S. Environmental Protection Agency 1988 Section 5.1.4].

The risk of serious fire should be further reduced by the installation of a new water line with greater water pressure.

The building would be constructed with noncombustible material in accordance with the uniform fire code.

4.9 Prepare a Business Plan for the Laboratory

A business plan addressing the use of hazardous materials at the laboratory must be prepared and submitted to the Richmond Fire Department (and the Richmond Planning Department) before a determination of fire hazard impact can be accurately made. The planning department is expecting this information to be evaluated during the environmental review process under CEQA. The business plan, as identified in the Hazardous Materials Release Response Plans and Inventory Law of 1985, should include:

- design details of the facility (including floor plans, storage locations, and facility description);

- an inventory of hazardous materials handled or stored at the facility;

- an emergency response plan, including notification and evacuation procedures;

- a training program in safety procedures and emergency response for hazardous materials designed for new employees, including annual refresher courses; and

- precautions taken in the handling of compressed gases (Howard pers. comm. University of California, Berkeley, Campus Planning Office and EIP Associates 1989).

4.10 Upgrade the Existing Waterline (as Needed) to Supply Adequate Water Pressure for Firefighting

An evaluation of the water requirements of the laboratory, the capacity of the water line, and firefighting water pressure needs should be conducted by the university, EBMUD, and the Richmond Fire Department. If upgrading is needed to comply with fire flow requirements the university would be responsible for the cost.

4.11 Install a Security System

The university should install a security system to guarantee the safety of all structures. The security system should be installed in all structures and, if deemed necessary by the EPA, the fenced parking area should also be protected with a security system.

4.12 Maintain Security Provided by the University

The university should continue to patrol the field station and should continue to maintain the university police station located in building 190.

4.13 Reroute and Underground Utilities that Cross the Site, as Proposed in the Project Description

The university intends to work with PG&E to reroute the existing overhead electrical line traversing the project. This line would be rerouted to the southwest side of the project site and undergrounded, as previously agreed to by the university and PG&E. Since the electrical lines at the field station are owned by the university, it would pay for the cost of rerouting and undergrounding.

4.14 Work with PG&E to Identify and Implement a Suitable Alignment for Rerouting the Gas Line Crossing the Site, if Necessary.

The university should work with PG&E to identify and implement a suitable course for rerouting the gas line crossing the site, if necessary. The gas line should be undergrounded with other utilities as proposed in the project description. Since the gas lines are owned by the university, it should pay for the cost of rerouting and undergrounding, if needed.

CHAPTER 5. Hazardous Materials (Substances and Wastes)

INTRODUCTION

This section addresses the presence of hazardous materials (i.e., hazardous substances and wastes) in the vicinity of the EPA laboratory site and the future use, storage, and disposal of hazardous substances at the laboratory.

Common examples of potential hazardous materials problems include:

- o presence of businesses that use or manufacture hazardous materials;
- o presence of pesticide or herbicide residues or petroleum products used for vegetation management;
- o presence of electrical transformers; and
- o presence of buildings or residences constructed with materials containing asbestos.

Information Sources

Most of the information presented in this report was obtained from two documents on hazardous substances at the field station. CH2M Hill summarized the results of environmental sampling at the field station in 1988 in a technical memorandum to the University of California. Ensco Environmental Services, Inc. prepared an environmental assessment for the field station in August 1989. Other documents reviewed and incorporated into this report include:

- o *Gas and Chemical Storage Facility for Storehouse, Draft Environmental Impact Report* (Baseline Environmental Consulting 1986);
- o *Draft Environmental Impact Report on the Proposed Northwest Animal Facility Project, University of California, Berkeley* University of California, Berkeley, (Campus Planning Office, and EIP Associates 1989);
- o *Abandoned Site Program Information System* (California Department of Health Services, Toxic Substances Control Division 1989);

- *Hazardous Waste and Substances Sites List* (California Office of Planning and Research, Office of Permit Assistance 1989);
- *Expenditure Plan for the Hazardous Substances Cleanup Bond Act of 1984* (California Department of Health Services, Toxic Substances Control Division 1989); and
- *Zoning Ordinance of the City of Richmond* (Richmond Planning Department 1988).

A site visit was conducted on January 6, 1989, by Jones & Stokes Associates to examine indications of past and present chemical storage, use, and disposal.

Assumptions and Limitations

The tasks performed to assess the significance of existing or future hazardous materials on the site provide a limited amount of information. This evaluation is not intended to be comprehensive, identify all potential concerns, or eliminate the possibility of acquiring land with environmental problems.

The scope of work was limited to a qualitative evaluation of environmental concerns associated with the potential presence of hazardous substances. This assessment did not include inaccessible areas within buildings or underground storage areas; sampling and analysis; or inspections within buildings to evaluate the presence of PCBs or asbestos.

AFFECTED ENVIRONMENT

Regulatory Setting

Definitions

The federal government's definition of hazardous substances in Comprehensive Environmental Response Compensation and Liability Act (CERCLA) refers to definitions within the Toxic Substances Control Act (TSCA), the Clean Water Act (CWA), the Solid Waste Disposal Act (SWDA), and the Clean Air Act (CAA) (Title 15, U.S.C. Section 2606 [a][1]; Title 33, U.S.C. Section 1321 [b][2][A]; Title 42, U.S.C. Section 6921; Title 42, U.S.C. Section 6901; Title 33 U.S.C. Section 1317 [a]; Title 42, U.S.C. Section 7412; and Title 15, U.S.C. Section 2606). The definition is complicated but can be generally summarized as follows: A hazardous substance is a substance or mixture, other than oil, which may present an imminent and substantial danger to public health and welfare and all natural resources, including the environment and all inhabitants of the environment.

The California Department of Health Services defines the term hazardous material as a substance or combination of substances which, because of its quantity, concentration,

or physical, chemical, or infectious characteristics, may either: 1) cause, or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible, illness; or 2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989). The definition of hazardous material includes both hazardous wastes and other hazardous substances.

According to the California Health and Safety Code (Section 25124), a hazardous waste is any hazardous material (i.e., toxic, ignitable, corrosive, or reactive) that is abandoned, discarded, or recycled (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989). Specific tests for toxicity, ignitability, corrosivity, and reactivity are set forth in Title 22 of the California Code of Regulations, Sections 66693-66708.

Two types of materials that are usually considered separately from "conventional" hazardous materials are radioactive materials and infectious or biohazardous materials. Radioactive material is any material or combination of materials that spontaneously emit ionizing radiation. Biohazardous material is any potentially harmful biologic material (including infectious agents, oncogenic viruses, and recombinant DNA) or any material contaminated with a potentially harmful biologic material (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Regulatory Agencies

Federal Agencies. The EPA is the principal environmental regulatory agency at the federal level. Other federal agencies involved in the regulation of hazardous materials include:

- U. S. Occupational Safety and Health Administration,
- U. S. Nuclear Regulatory Commission,
- U. S. Department of Transportation, and
- U. S. National Institute of Health.

State Agencies. Within the state, the California Department of Health Services has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with the state agency (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989). Other state agencies involved in the regulation of hazardous materials include:

- California Regional Water Quality Control Board,
- California Department of Health and Welfare,
- California Occupational Safety and Health Administration (Cal OSHA), and
- California Office of Emergency Services.

Policies and Regulations

University and EPA policy requires compliance with all applicable state, federal, and local laws, although, neither the university nor the EPA are required to abide by local regulations since the property is owned by the state. The City of Richmond regulates use of hazardous materials within city boundaries.

In addition to the laws governing the use of hazardous materials, federal and state laws also exist to control the generation, transportation, and disposal of hazardous wastes (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Federal Laws. Applicable federal regulations are contained primarily in Titles 29, 40, and 49 of the Code of Federal Regulations. These include:

- Emergency Planning and Community Right-to-Know Act (EPCRTKA),
- Resource Conservation and Recovery Act (RCRA),
- Occupational Safety and Health Act (OSHA),
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA),
- Comprehensive Environmental Response Compensation and Liability Act (CERCLA),
- Superfund Amendments and Reauthorization Act Title III (SARA), and
- National Institute of Health and National Cancer Institute Guidelines for Carcinogens and Biohazards (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

State Regulations. State regulations applicable to hazardous materials have been consolidated into Title 26 of the California Code of Regulations (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989). Applicable state laws include:

- Hazardous Materials Release Response Plans and Inventory Act,
- Hazardous Waste Control Act, and
- California Occupational Safety and Health Act (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

The EPA laboratory would be required to implement the following programs under these state regulations:

- supply protective equipment and personnel training,
- establish an accident and illness program,

- o inform employees of the potential for exposure to hazardous materials,
- o provide written information about the hazardous materials at the laboratory,
- o control airborne contaminants,
- o prepare emergency action plans, and
- o prepare a fire prevention plan (Baseline Environmental Consulting 1986).

Hazardous Materials Management Planning

State law requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of and to prevent or minimize injury to human health or the environment in the event that such materials are accidentally released. Federal laws, such as the EPCRTKA of 1986, impose similar requirements (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

The Hazardous Materials Release Response Plans and Inventory Law of 1985 (also known as the Business Plan Act, Assembly bill 2189) requires businesses using hazardous materials to prepare a plan that includes:

- o design details of the facility (including floor plans, storage locations, and a facility description);
- o an inventory of hazardous materials handled or stored at the facility;
- o an emergency response plan, including notification and evacuation procedures;
- o a training program in safety procedures and emergency response for hazardous materials for new employees, with annual refresher courses; and
- o precautions taken in the handling of compressed gases (Howard pers. comm. and the University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

In 1988, the act was amended to include public agencies. State agencies, including the University of California, were required to submit business plans to local administering agencies by January 1, 1990. The local administering agency for the field station is the Contra Costa County Department of Environmental Health. By January 1, 1992, state agencies must also comply with local regulations implementing the Business Plan Act (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989). Because the state is involved in the lease agreement for the proposed EPA laboratory, the federal government would have to comply with these requirements as well.

City of Richmond Requirements. The Richmond Fire Department enforces the California Uniform Fire Code and inspects Richmond businesses that handle hazardous

materials. All storage or use of hazardous substances must be approved by the fire chief and be in conformance with all applicable fire and building codes (Baseline Environmental Consulting 1986).

The City of Richmond regulates the use of hazardous materials with the zoning ordinance. Hazardous materials, as they would relate to the EPA laboratory, are addressed in Section 15.04.145 of the zoning ordinance.

Use of the following chemicals in laboratory amounts is a permitted use in the Special Industrial District, Light Industrial/Research and Development zone:

- Class A and B poisons;
- highly unstable materials, including organic peroxides (Class I-II); oxidizers (Class IV); phyrophoric materials, unstable materials (Class IV-III); and water-reactive materials (Class III);
- moderately hazardous materials, including corrosives, flammable gases, flammable liquids, flammable solids, organic peroxides (Class III); oxidizers (Class III-II); and water-reactive materials (Class II); and
- materials with limited hazards, including combustible liquids, irritants, oxidizers (Class I); organic peroxides (Class IV-V); sensitizers, unstable materials (Class II-I); and water-reactive materials (Class 1). (City of Richmond Planning Department 1987.)

The zoning ordinance identifies 10 standards of operation for uses in the Special Industrial District, Light Industrial/Research and Development zone (M-S, LI/R&D). The following discussion reviews some of these standards as applicable to the proposed project.

- All uses must comply with the regulations of the Bay Area Air Quality Management District (BAAQMD), the Regional Water Quality Control Board, the San Francisco Bay Conservation and Development Commission, the California Department of Health Services, and the Contra Costa County Environmental Health Department, and other relevant regulatory agencies.
- No use shall be permitted which creates emissions that endanger human health, can cause damage to animals, vegetation, or other property, or which can cause soiling at any point beyond the boundaries of the site.
- No continuous, frequent, or repetitive odors are permitted which are perceptible on or beyond the property line.

Hazardous Materials Transportation

The U. S. Department of Transportation (DOT) has the regulatory responsibility for the safe transportation of hazardous materials between states. DOT regulations govern all means of transportation, except for those packages shipped by mail, which are covered by

the U. S. Postal Service (USPS) regulations. DOT regulations are contained in the Code of Federal Regulations Title 49 (49 CFR); USPS regulations are in 39 CFR. The State of California has adopted these federal regulations for the intrastate movement of hazardous materials. State regulations are contained in Title 26 of the California Code of Regulations (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Under RCRA, the EPA sets standards for transporters of hazardous waste. The federal government authorized the State of California to carry out EPA regulations for transportation of hazardous waste material originating in the state or passing through the state. State regulations are contained in the California Code of Regulations, Title 26 (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Two state agencies have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies: the California Highway Patrol and the California Department of Transportation (Caltrans). The California Highway Patrol enforces hazardous materials and hazardous waste labeling and packing regulations. The goal of these regulations is to prevent leakage and spills of material in transit and to provide detailed information to cleanup crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the California Highway Patrol, which conducts regular inspections of licensed transporters to ensure regulatory compliance (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Hazardous Material Worker Safety Requirements

Cal OSHA and the Federal Occupational Safety and Health Administration (Fed OSHA) are the agencies responsible for ensuring worker safety in the handling and use of chemicals in the work place. In California, Cal OSHA assumes primary responsibility for developing and enforcing work place safety regulations. Cal OSHA standards are generally more stringent than federal regulations (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Cal OSHA regulations concerning the use of hazardous materials include requirements for safety training, availability of safety equipment, hazardous substance exposure warnings, emergency action plan preparation, community right to know, and fire prevention plan preparation. Cal OSHA enforces the hazard communication program regulations which address identification and labeling of hazardous substances, provision of employees with Material Safety Data Sheets (MSDSs), descriptions of the hazards of chemicals, and documention of employee training programs. These regulations also require the campus to prepare emergency action plans, including escape and evacuation procedures and alarm systems (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Both federal and state laws include extensive provisions for educating research laboratory employees, including training in chemical work practices. The training must include methods of safe handling of hazardous materials, an explanation of MSDS's, use of emergency response equipment, and implementation of building emergency response plans

and procedures (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Hazardous Waste Handling Requirements

The EPA administers a "cradle to grave" regulatory program (i.e., from manufacture of the hazardous material to disposal) under RCRA for hazardous wastes. Under RCRA, EPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Federal hazardous waste management programs may be delegated to individual states, provided they are at least as rigorous as RCRA's. The state programs must be approved by the EPA. In California, approval of the state program is still pending, so both state and federal hazardous waste laws apply. The state program was created by enactment of the Hazardous Waste Control Law (HWCL), which governs the generation, transportation, and disposal of hazardous wastes. The state's HWCL regulations are generally more stringent than the RCRA regulations (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

The HWCL establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management programs for hazardous wastes; establishes permit requirements for hazardous waste treatment, storage, disposal and transportation; and identifies hazardous wastes that cannot be disposed of in landfills (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Under both RCRA and the HWCL, the generator of a hazardous waste must complete a manifest which accompanies the waste from the generator to the ultimate treatment, storage, or disposal location. The manifest characterizes the waste and describes its intended destination. Copies must be filed with the California Department of Health Services. Waste generators must also match copies of manifests with receipt from the waste treatment, storage, or disposal facility to which it sends waste (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Radioactive Materials Requirements

The EPA laboratory may test drinking water, wastewater, or soil for the presence of radionuclides. Thus, the following requirements for the handling of radioactive materials have been included in this discussion.

The Federal Atomic Energy Act, as administered by the U. S. Nuclear Regulatory Commission, regulates the use, transportation, and disposal of radioactive material. Individual states may assume these responsibilities for low-level radioactive wastes and for public protection from radiation hazards (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

The California Department of Health Services administers the Radiation Control Law, which governs the storage, use, transportation, and disposal of sources of ionizing radiation. State regulations concerning radioactive substances are included in Title 17 of the California Code of Regulations. The California Department of Health Services regulations require registration of ionizing radiation sources, licensing of radioactive material, protection against radiation exposure, transportation of radioactive materials, and disposal of radioactive waste. Persons who possess a source of ionizing radiation must maintain detailed records relating to the receipt, storage, transfer, and disposal of such materials (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Infectious Waste Handling Requirements

The EPA laboratory may test environmental samples for the presence of bacteria, parasites, and viruses. Thus, the following requirements for the handling of infectious waste have been included in this discussion.

Infectious waste is generally regulated in the same manner as hazardous waste, except that special provisions apply to the storage, containment, and transportation of infectious wastes (Section 22 of the California Code of Regulations, pages 66835-66869). These regulations require that infectious wastes be stored in refrigerated facilities for no more than 90 days and that such wastes be properly packaged and labeled. Steam sterilization units are used to render infectious waste noninfectious. These units must meet specific design standards established by the California Department of Health Services (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

Emergency Response to Hazardous Materials Incidents

Pursuant to the Emergency Services Act, the state has developed an emergency response plan to coordinate emergency services provided by federal, state, and local governmental agencies and private persons. Response to hazardous materials incidents is one part of this plan. The plan is administered by the California Office of Emergency Services. The California Office of Emergency Services coordinates the responses of other agencies, including the EPA, the California Highway Patrol, the California Department of Fish and Game, the Regional Water Quality Control Board, the Bay Area Air Quality Management District, and the City of Richmond Fire Department (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

In addition, pursuant to the business plan law, local agencies are required to develop area plans for response to releases of hazardous materials and wastes. These emergency response plans depend to a large extent on the business plans submitted by persons who handle hazardous materials, as described above. An area plan must include preemergency planning and procedures for emergency response, notification and coordination of affected governmental agencies and responsible parties, training, and followup (University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

The EPA must meet state requirements identified in Assembly Bill 2189 if they will be handling at least 50 gallons, 500 pounds, or 200 cubic feet of potentially hazardous materials. This bill, in addition to Assembly Bill 2185, requires preparation of a business plan by businesses or operations using certain quantities of hazardous materials. The State of California has authorized the Contra Costa County Health Department to enforce Assembly Bill 2189. The County Health Department, in turn, has contracted with the Richmond Fire Department to perform facility inspection and verify storage and use of hazardous materials (Howard 1989).

If the EPA intends to handle highly toxic materials, Assembly Bill 3777 requires the preparation of a risk management plan which is regulated by the County Health Department (Howard pers. comm.).

Existing Hazardous Materials Use in the Site Vicinity

Given that the field station's purpose is to provide space for research and that the site is located in an industrial area, many of the adjacent land uses involve hazardous materials or have involved hazardous materials in the past.

Richmond Field Station

The University of California has submitted a business plan to the Contra Costa County Department of Environmental Health which includes an emergency action plan for use in the event of an accident and safety procedures for daily use. The safety procedures provide information on accident reporting, disposal of waste materials, and equipment operation and maintenance (University of California, Berkeley, College of Engineering, Richmond Field Station 1990).

Hazardous substances used at the field station include organic solvents (such as acetone) and acids (e.g., hydrochloric acid). Building 111, located southeast of the laboratory project site, is used to store hazardous materials, including acids. The *Hazardous Materials Business Plan* includes more specific information about chemicals used at the field station (University of California, Berkeley, College of Engineering, Richmond Field Station Administration 1990).

Project Site

Building 128 is currently used by Solid Waste Management and Resource Recovery. According to Glaud Kuykendall (pers. comm.), this facility is used by a private company to design mechanical equipment for recycling plastic.

Approximately 10 unmarked 55-gallon drums are stored behind building 128. The contents of these drums are unknown. A small storage shed (building 131) also houses 55-gallon drums whose contents are unknown.

A telephone line traverses the project site in an east-west direction. One of the telephone poles on the project site supports a transformer containing PCBs. This transformer is scheduled to be removed before September 1990 (Bell pers. comm.).

Historical Hazardous Materials Usage at the Richmond Field Station

Between 1850 and 1950 the eastern portion of the field station was used for the production of explosives and munitions and the handling of related hazardous materials. Some time after 1900, California Cap Company purchased portions of the field station from the Hercules Powder Company, one of several explosives manufacturers located at the field station.

By the 1920s California Cap Company had acquired additional field station parcels from other small explosives companies, making it the sole manufacturer of explosives at the site. California Cap Company manufactured explosives until the end of World War II, at which time the property was sold to the University of California (Ensco Environmental Services, Inc. 1989). California Cap Company's facility included a mercury fulminate (an explosive salt) production facility, a shell manufacturing facility, a blasting cap manufacturing facility, and an explosives storage area (Figure 5-1).

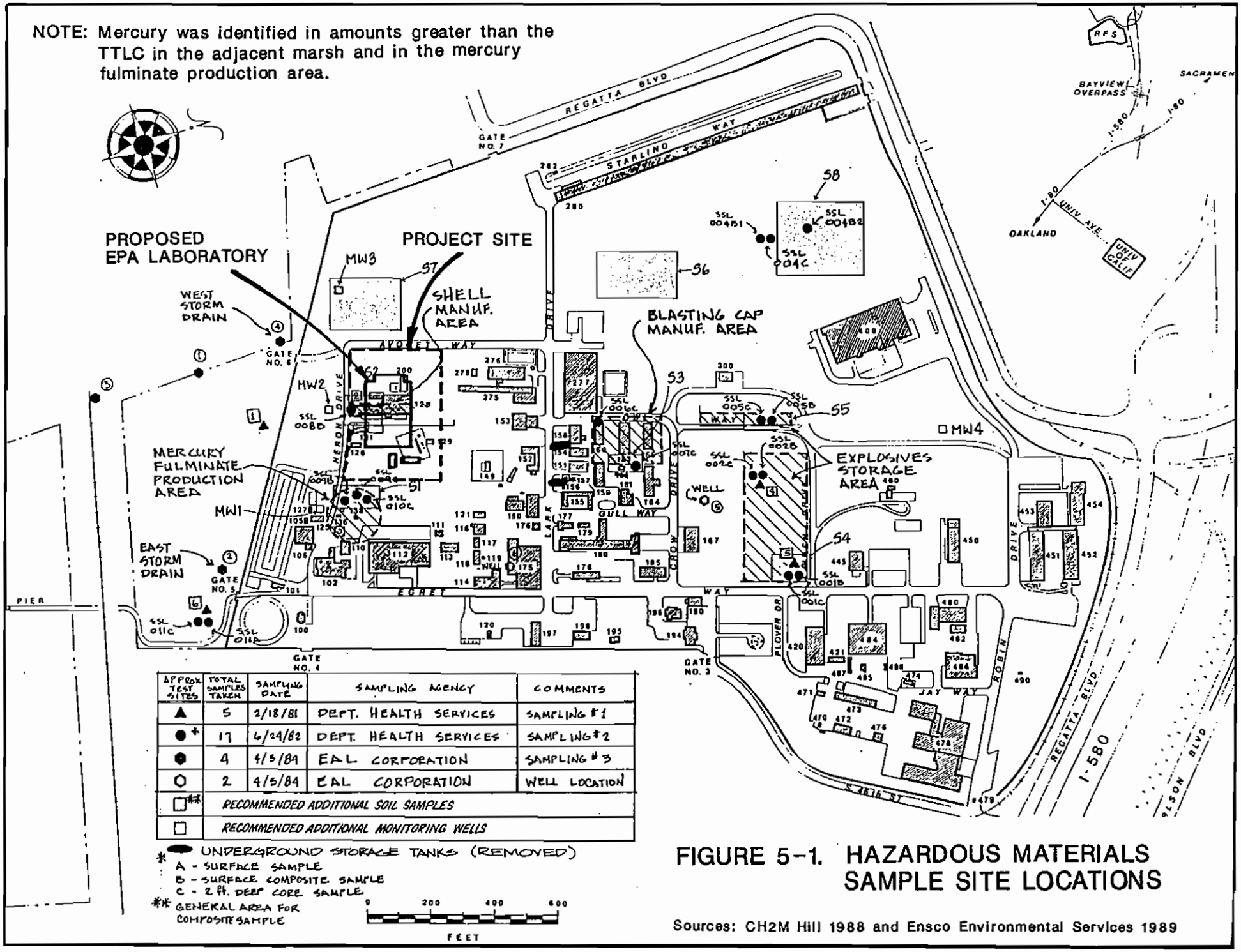
In 1950, the field station was sold to the University of California. As part of the purchase agreement, California Cap Company agreed to remove all hazardous materials from the field station (Ensco Environmental Services, Inc. 1989). California Cap Company reportedly complied with this requirement; however, subsequent site testing and onsite observations revealed potential hazardous waste problems. For example, several explosions of unknown magnitudes occurred between 1950 and 1953 when the University of California attempted to clear the vegetation by burning the field station (ICF Technologies, Inc. 1988).

Environmental Sampling and Evaluation for Hazardous Materials

The following discussion summarizes the findings of previous hazardous material at the field station.

Department of Health Services Testing - 1981. In 1980, the California Department of Fish and Game, Cal OSHA, the San Pablo Sanitary District, and the University of California became concerned about potential mercury contamination at the field station. The hazardous materials department of the California Department of Health Services began an abandoned site investigation in 1981. Twelve soil samples were taken in 1981 throughout the field station with one sample taken at the project site in the vicinity of the previous shell manufacturing facility (Figure 5-1). Each sample was analyzed for metals and DDT. The results of the testing indicated elevated levels of mercury (Table 5-1). Arsenic, copper, zinc, lead, and DDT were also identified in the samples, but in quantities less than total threshold limit concentrations (TTLCs). The highest levels of mercury were found in the adjacent shoreline marsh, south of the field station and the project site. The marsh sample was a composite sample from six locations in the marsh (ICF Technologies, Inc. 1988).

NOTE: Mercury was identified in amounts greater than the TTLC in the adjacent marsh and in the mercury fulminate production area.



APPROX TEST SITES	TOTAL SAMPLES TAKEN	SAMPLING DATE	SAMPLING AGENCY	COMMENTS
▲	5	2/18/81	DEPT. HEALTH SERVICES	SAMPLING #1
●*	17	6/24/82	DEPT. HEALTH SERVICES	SAMPLING #2
⬢	4	4/5/84	EAL CORPORATION	SAMPLING #3
○	2	4/5/84	EAL CORPORATION	WELL LOCATION
□**	RECOMMENDED ADDITIONAL SOIL SAMPLES			
□	RECOMMENDED ADDITIONAL MONITORING WELLS			

UNDERGROUND STORAGE TANKS (REMOVED)

* A - SURFACE SAMPLE
B - SURFACE COMPOSITE SAMPLE
C - 2 ft. DEEP CORE SAMPLE

** GENERAL AREA FOR COMPOSITE SAMPLE

0 200 400 600
FEET

FIGURE 5-1. HAZARDOUS MATERIALS SAMPLE SITE LOCATIONS

Sources: CH2M Hill 1988 and Ensco Environmental Services 1989

Table 5-1. Summary of Hazardous Waste Testing at the Richmond Field Station

	Arsenic (ppm)	Chromium (ppm)	Manganese (ppm)	Mercury (ppm)	Lead (ppm)	Zinc (ppm)	Copper (ppm)	DDT (ppm)	DDE (ppm)
CH2M Hill (1988)									
S1-Composite	18	24.6	482	260*	36.4	436.0	223.0	BDL	BDL
S2-Composite	13	30.9	533	0.53	19.0	100.0	47.5	BDL	BDL
S3-Composite	4.4	92.1	554	0.34	16.0	24.5	16.0	BDL	BDL
S4-Composite	5.5	44.7	749	0.39	9.0	30.9	15.0	BDL	BDL
S5-Composite	4.8	49.0	819	0.38	38.1	40.5	24.2	BDL	BDL
S6-Composite	2.8	28.3	372	0.07	7.7	19.0	15.0	BDL	BDL
EAL Corporation (1984)	Below TTLC	Below TTLC	Below TTLC	Below TTLC	Below TTLC	Below TTLC	Below TTLC	Not Analyzed	Not Analyzed
Department of Health Services (1982)	283	–	–	BDL	985	910	577	BDL (Hoffman Marsh)	BDL (Hoffman Marsh)
Department of Health Services (1981)	190	–	–	105*	524	789	506	1.7	–
TTLC standard	500	2,500	No standard	20	1,000	5,000	2,500	No standard	No standard

* Above total threshold limit concentration.
BDL = Below detectable limits.
TTLC = total threshold limit concentration (Title 22 of the California Code of Regulations).

Department of Health Services Testing - 1982. The Department of Health Services tested the field station again in 1982 to check their previous results. They collected 17 soil samples and analyzed metals, DDT, and DDE. One of the samples was obtained from the marsh and one from the proposed EPA laboratory site. No detectable mercury, DDT, or DDE were identified in the samples. However, arsenic, zinc, copper, and lead were detected in amounts higher than those found in the remainder of the field station, but less than found in the TTLCs (Table 5-1) (ICF Technologies, Inc. 1988).

The California Department of Health Services concluded that no mercury or DDT contamination had occurred on the site and that the Richmond Field Station would be removed from the abandoned hazardous wastes sites list (ICF Technologies, Inc. 1988). The California Department of Health Services submitted a recommendation to the EPA stating that no further action was required.

Bay Area Regional Water Quality Control Board Testing - 1984. In 1984, the Bay Area Regional Water Quality Control Board requested that the university test surface runoff and groundwater for contaminants. The university hired EAL Corporation to test for metals and the results were all below TTLCs. The university did not assess the potential presence of DDT (ICF Technologies, Inc. 1988).

EPA Evaluation - 1988. In 1988, a field investigation team hired by the EPA (ICF Technology, Inc. 1988) determined that no further action under CERCLA was necessary for the Richmond Field Station site and that the site was not eligible for the national priority list because:

- o there were no observed releases to the groundwater, surface water, or air; and
- o no groundwater or surface water within 3 miles of the site was used for drinking water (ICF Technologies, Inc. 1988).

The field investigation team did, however, recommend that the site be held as active for review under the new hazards ranking system expected to be implemented sometime during 1990. The recommendation to keep the site on the active list was based on the following conclusions:

- o mercury, DDT, and other metals were originally detected in the soils and water of the shoreline marsh;
- o previous sampling appeared to be inadequate to fully characterize site contamination;
- o onsite surface water drains directly into the shoreline marsh and could potentially transport contaminants to the aquatic food chain (ICF Technologies, Inc. 1988).

Thus, the field station is currently on the EPA's site evaluation list for further investigation into the potential presence of hazardous materials. It is not on the Superfund

national priority site list, although if evidence is found indicating that the site is contaminated, it could possibly be listed on the national priority site list.

CH2M Hill Testing - 1988. At the request of the university, CH2M Hill tested six areas of the field station in 1988 for metals, pesticides, and volatile organics. The property immediately southeast of the EPA laboratory site (the mercury fulminate production area) was tested. No volatile organics or pesticides were detected during the sampling and metals were detected in low quantities over most of the site except for the old mercury fulminate production area. Mercury was observed at 13 times the TTLC at this site (260 parts per million). High concentrations of lead, zinc, and copper were also identified but the amounts did not exceed the TTLCs.

Ensco Environmental Services, Inc. - 1989. Ensco Environmental Services, Inc. prepared an environmental assessment for the field station in 1989 at the request of the university for the purposes of developing a master plan for the field station. Ensco conducted a physical site assessment, contacted knowledgeable persons, reviewed existing documentation, and prepared conclusions and recommendations (Ensco Environmental Services, Inc. 1989).

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 field station. No contamination of the soil underneath the tanks had occurred (Ensco Environmental Services, Inc. 1989).

Based on a review of historical aerial photographs, interviews with key field station personnel, and a review of available public records, Ensco Environmental Services, Inc. also concluded that soils and groundwater beneath the field station may have been subject to environmental impairment from manufacturing and handling of hazardous materials associated with the long history of industrial activities on the field station and at adjacent sites.

Soil samples collected from the former explosives storage facility, blasting cap manufacturing facility, and shell manufacturing facility were not analyzed for nitrogen-containing compounds which would be used in munitions manufacturing. Finally, groundwater under these areas has not been analyzed for nitrogen-containing compounds or volatile organic compounds (Ensco Environmental Services, Inc. 1989).

Based on these conclusions, Ensco Environmental Services recommended additional testing at the field station, including the EPA laboratory project site. Their recommendations are included below in a section entitled "Mitigation Measures."

Summary of Contra Costa County Health Services, Identified Hazardous Waste Sites in the Vicinity of the Richmond Field Station. Recent listings of unauthorized fuel leaks and reported toxic spills were reviewed by Ensco Environmental Services, Inc. (1989). 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 America, and Liquid Gold Oil Corporation, a former oil recycler located near ICI America. A summary of each case is presented below (Ensco Environmental Services, Inc. 1989).

Bio Rad Laboratories. Bio Rad Laboratories (located at 32nd Street and Regatta Boulevard) uses radioactive materials. 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 on behalf of workers at the site who were exposed to the release and involved in cleanup operations (Ensco Environmental Services, Inc. 1989).

Contamination by chloroform and acrylamide of a creek located on Bio Rad land had occurred. The extent of the spill was not defined (Ensco Environmental Services, Inc. 1989).

ICI Americas. ICI Americas manufactures sulfuric acid and organic herbicides at the old Stauffer laboratory manufacturing plant (located at 1415 South 47th Street) east of the field station. ICI Americas also manufactures or generates pyrite cinders, fuels, ferric sulfate, pesticides, solvents, and alum.

Groundwater monitoring wells were installed on the site and samples were collected for analyses of priority metals and organic compounds; however, no conclusions were reported by CH2M Hill due to difficulties in interpreting the analytical results (Ensco Environmental Services, Inc. 1989).

Shallow groundwater contaminated with pesticides is currently being extracted and treated at ICI. This site has also been cited by Contra Costa County for noncompliance regarding treatment and storage, and disposal of hazardous wastes without appropriate regulatory agency permits (Ensco Environmental Services, Inc. 1989).

Liquid Gold Oil Corporation. The Liquid Gold site is located southeast of the field station and ICI Americas. From 1974 to 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; discharged into ponds, sumps, and ditches on the site; and drained into nearby wetland 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 (Ensco Environmental Services, Inc. 1989).

Las Vegas Laboratory Hazardous Waste Handling

The existing EPA Region 9 laboratory, located in Las Vegas, Nevada would be replaced by the proposed EPA laboratory at the Richmond Field Station. All of the functions performed at the Las Vegas laboratory would be transferred to the proposed field station laboratory. Thus, the chemicals and procedures currently used at the Las Vegas laboratory would also be used at the proposed project laboratory.

The Las Vegas EPA laboratory uses acetone, hexane, hydrochloric acid, methanol, methylene chloride, and nitric acid in quantities ranging from 1-12 gallons each month (Table 5-2).

The Las Vegas EPA laboratory, classified as a small producer, yields approximately 750 gallons of liquid hazardous wastes and 1,000 pounds of compacted solid hazardous wastes each year (Husby pers. comm.). Of the samples that enter the laboratory for analysis, 25 percent leave the facility as hazardous wastes. The remaining 75 percent of the samples are not harmful and are disposed of in a municipal landfill (Johnson pers. comm.).

Hazardous wastes generated by the tests described in Chapter 2 are packaged by the laboratory scientists and kept in a storage area for future disposal. The EPA has contracted with a hazardous wastes transportation company to haul the wastes from the laboratory. The contractor examines the materials and transports those wastes that he is licensed to carry. For example, dioxin may not be transported in Nevada, so all dioxin must stay at the laboratory until special arrangements can be made for transportation and disposal (Smiecinski pers. comm.)

Hazardous wastes are removed from the Las Vegas laboratory approximately every 3 months. The transporter will typically fill a tractor-trailer with the waste generated over several months at the laboratory, although much of the shipment consists of absorbent packing material (Smiecinski pers. comm.).

ENVIRONMENTAL CONSEQUENCES

Significance of Impacts

The following questions were used to determine the significance of impacts resulting from implementation of the EPA laboratory project. They are part of the University of California *Procedural Handbook and Model Approach for Implementing the California Environmental Quality Act.*

- Does the project pose a public health and safety hazard through release of emissions or risk of upset?
- Does the project interfere with emergency response plans or emergency evacuation plans?
- Does the project expose sensitive receptors to substantial pollutant concentrations?
- Does the project result in unsafe conditions for employees or students?

Implementation of the EPA laboratory project would result in the continued use of chemicals currently used at the Las Vegas laboratory. Some of the chemicals that would

Table 5-2. Chemicals Used in Large Quantities at the EPA Region 9 Laboratory, Las Vegas, Nevada

Chemical Name	Average Monthly Use	Maximum Amount Present
Acetone	2-4 gallons	15 gallons
Hexane	1 gallon	4 gallons
Hydrochloric acid	12 gallons	--
Methanol	1 gallon	2 gallons
Methylene chloride	8-12 gallons	24 gallons
Nitric acid	12 gallons	--

Source: Johnson pers. comm.

be used by the EPA laboratory are currently used at the field station. The EPA would conform to all local, state, and federal regulations regarding the use, storage, and disposal of hazardous materials and waste, and thus, the use of these chemicals at the field station would be considered a less-than-significant impact.

Conclusion:

- o Impact finding: The project would result in the continued use of chemicals currently used at the Las Vegas laboratory.
- o Significance: None.
- o Mitigation measures: None required.

The potential for accidental spills or release of hazardous materials or wastes both onsite and offsite would result from project implementation. Accidental spills could occur during movement of hazardous materials, either to and from the site or between the laboratory and the hazardous materials storage building. Exposure to hazardous materials and environmental contamination could result. The impact of this accident potential could be reduced by continuing to implement safety precautions taken at the Las Vegas laboratory and by preparing a hazardous materials business plan.

Conclusion:

- o Impact finding: The potential for accidental spills or release of hazardous materials or wastes both onsite and offsite would result from project implementation.
- o Significance: Less than significant.
- o Mitigation measures: 5.1 Continue to implement safety precautions taken at the Las Vegas laboratory and prepare a hazardous materials business plan.

Laboratory workers and visitors to the facility may be exposed to hazardous materials. This impact could occur either as a result of existing hazardous wastes in the vicinity of the site (i.e., the high concentrations of mercury near building 136), or as a result of accidental releases of hazardous materials at the EPA laboratory. This impact is considered potentially significant.

Conclusion:

- o Impact finding: Laboratory workers and visitors to the facility may be exposed to hazardous materials.
- o Significance: Potentially significant.

- Mitigation measures:
  - 5.1 Continue to implement safety precautions taken at the Las Vegas laboratory and prepare a hazardous materials business plan.
  - 5.2 Assess the potential presence of mercury at the former mercury fulminate production area and eradicate it from the site if found to be an unacceptable health hazard.
  - 5.3 Assess the potential presence of nitrates and volatile organic compounds on the project site at the former shell manufacturing area; if these materials are identified on the site, assess the health risk and eradicate if necessary.
  - 5.4 Identify and dispose of hazardous materials stored onsite, if any.

Mitigation Measures

5.1 Continue to Implement Safety Precautions Taken at the Las Vegas Laboratory and Prepare a Hazardous Materials Business Plan

The EPA should continue to implement safety precautions taken at the Las Vegas laboratory regarding requirements for fire extinguishers, use of fume hoods, storage of hazardous substances and wastes, handling of chemical spills, and disposing of waste materials. The EPA should also prepare a hazardous materials business plan as previously suggested in this chapter in the section entitled "Hazardous Materials Management Planning." This plan would outline types and quantities of hazardous materials and wastes to be located at the laboratory, compliance with Richmond's hazardous waste regulations, evacuation procedures, and an employee training program for handling hazardous materials.

5.2 Assess the Potential Presence of Mercury at the Former Mercury Fulminate Production Area and Eradicate it from the Site if Found to be an Unacceptable Health Hazard

The mercury fulminate production area, located adjacent to the proposed EPA laboratory site, should be retested to determine the lateral and vertical extent of mercury contamination, previously documented in the area. The university should perform the following testing, as recommended by Ensco Environmental Services, Inc.:

- Drill a maximum of 20 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 hole, and analyze each water sample for mercury (Ensco Environmental Services, Inc. 1989).

If mercury is found near the project site and presents an unacceptable health hazard, the university should coordinate removal efforts with the California Department of Health Services.

5.3 Assess the Potential Presence of Nitrates and Volatile Organic Compounds on the Project Site at the Former Shell Manufacturing Area; if these Materials are Identified on the Site, Assess the Health Risk and Eradicate, if Necessary

The university should perform the following tests, as recommended by Ensco Environmental Services, Inc.:

- Drill a maximum of 20 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 hole, and analyze each water sample for nitrates and volatile organic compounds (Ensco Environmental Services, Inc. 1989).

- 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 (Ensco Environmental Services, Inc. 1989).

If nitrate residues or volatile organic compounds are identified on the project site, the potential health risk should be assessed and the wastes removed, if necessary.

5.4 Identify and Dispose of Hazardous Materials Stored Onsite, if Any

As previously stated, approximately 10 unmarked 55-gallon drums are stored behind building 128. The contents of these drums are unknown. A small storage shed (building 131) also houses 55-gallon drums with unknown contents. The contents of these drums should be identified and the containers should be transported off the project site by a certified hazardous waste hauler for disposal or recycling if the contents are considered hazardous.

CHAPTER 6. Circulation

AFFECTED ENVIRONMENT

Description of Existing Roadway Network

Freeway Access

The circulation system in the vicinity of the field station has changed substantially over the past several years. The biggest change was the extension of Interstate Highway 580 (I-580; also known as the Knox Freeway) from Albany, through the south part of Richmond, to the Richmond/San Rafael Bridge. I-580 replaced Hoffman Boulevard, which was used as an expressway (i.e., high-speed roadway with at-grade crossings) through Richmond. Figure 6-1 depicts the most current roadway alignments.

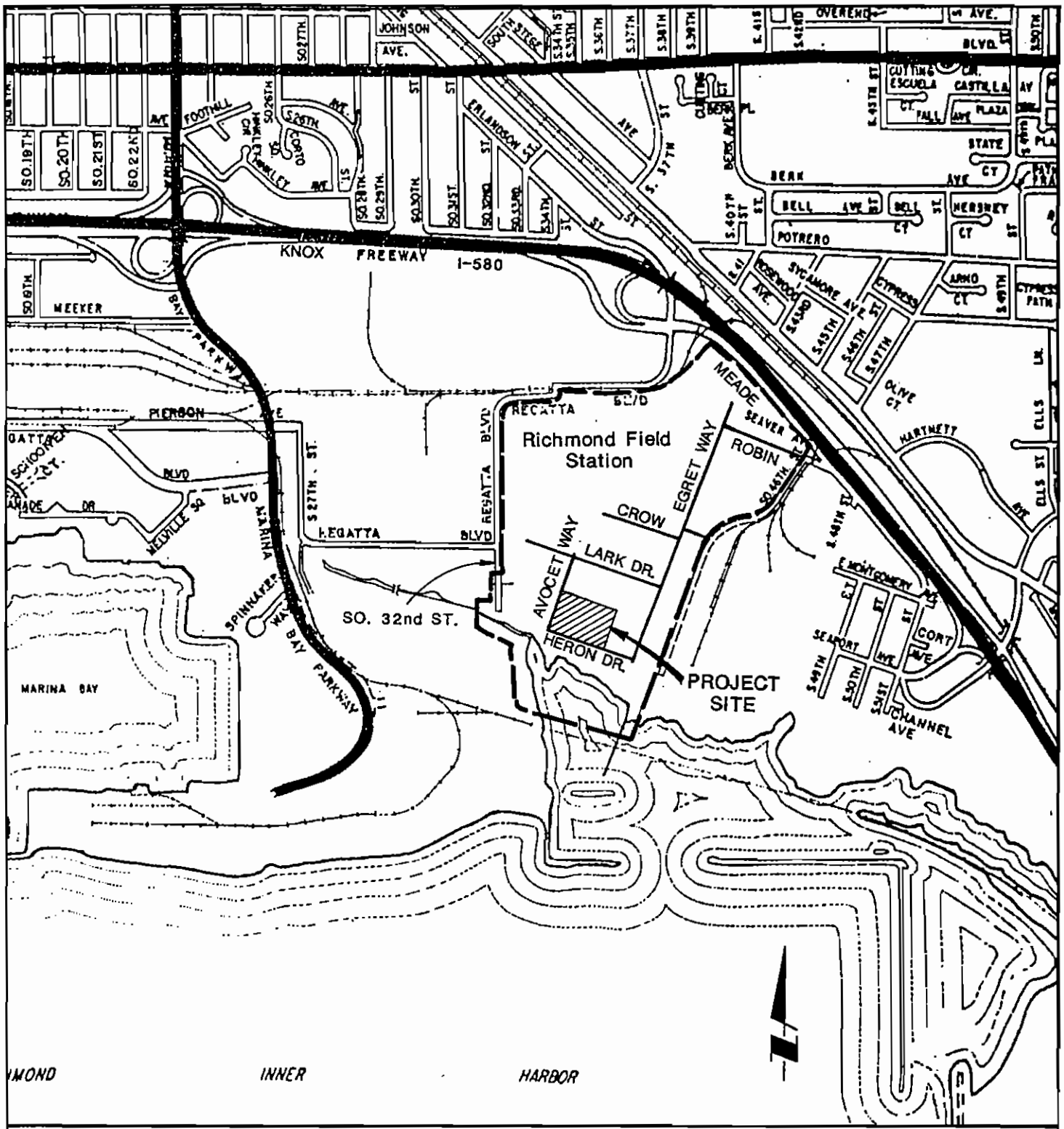
The Richmond Field Station is easily reached from I-580 by means of three interchanges: the Bayview, Regatta/Erlandson, and Marina Bay interchanges. The Regatta/Erlandson interchange is closest to the field station.

City Streets

Meade Street (a collector street), Regatta Boulevard (a collector street; previously named Griffin Avenue, South 32nd Street, South 46th Street, and Seaver Avenue), Bayview Avenue, and South 46th Street are the city streets used to reach the field station.

Regatta Boulevard is the only road connecting the Erlandson/Regatta interchange with the land uses west of Marina Bay Parkway. This road follows a circuitous path around the field station that the City of Richmond would like to straighten. The city has identified a new route for Regatta Boulevard that would extend from the intersection of Regatta Boulevard and South 32nd Street to Meade Street near the university's buildings 451 and 452. The city expects this arterial would have four lanes with a speed limit of roughly 40 miles per hour (Markowitz 1989b). If this new shoreline arterial is implemented, the university's Northern Regional Library Facility would be segregated from the main part of the field station by Regatta Boulevard.

The city expects that both the Bayview and Regatta/Erlandson interchanges will require upgrading as the south shoreline experiences more development (Grandy and Markowitz 1989).



NOTE: DARKENED STREETS INDICATE ARTERIALS

FIGURE 6-1. EXISTING ROAD ALIGNMENTS, RICHMOND CALIFORNIA

Table 6-1. 24-Hour Traffic Count for East-West
Regatta Boulevard at South 32nd Street
May, 1989

Time	Day	Count
11:30 a.m. - 12:30 p.m.	Tuesday	344
12:30		361
1:30		314
2:30		356
3:30		287
4:30		266
5:30		253
6:30		203
7:30		128
8:30		30
9:30		18
10:30		14
11:30 p.m. - 12:30 a.m.	Wednesday	4
12:30		5
1:30		9
2:30		38
3:30		21
4:30		61
5:30		94
6:30		151
7:30		196
8:30		120
9:30		150
10:30		320
24-Hour Average		3,743

Source: City of Richmond Public Works Department 1989

Richmond Field Station Roadway Network

The field station is fenced and gated to limit access to authorized persons. The main gate is located near the intersection of South 46th and Meade Streets. A delivery entrance is located at the south terminus of South 46th Street. The main gate is closed on weekends but the delivery entrance is open for general use.

Roadways within the field station that would be used to reach the project site include Robin Drive, Egret Way, Lark Drive, Avocet Way, and Heron Drive.

The university previously considered connecting Lark Drive (also known as Griffin Avenue) to Regatta Boulevard on the west side of the field station to provide access to the EPA laboratory. This entrance would have served the EPA laboratory only and not the entire field station. This circulation pattern has been temporarily abandoned. Instead, the EPA laboratory would be reached by the main gate and would use the field station's existing circulation system. The university plans to evaluate the other circulation pattern as part of their research center master plan at a future date.

Existing Traffic Volumes

South 46th Street at Meade Street

The City of Richmond has traffic counts for South 46th Street near Meade Street, but they are no longer valid due to major changes in the circulation pattern.

The only traffic using South 46th Street (south of I-580) would be that affiliated with either the field station or ICI. Since ICI has a main gate at Meade Street and East Montgomery Avenue, trips generated by ICI at Meade and South 46th Streets are expected to be minimal. With ICI's planned expansion, the total number of trips generated by ICI employees is roughly 185 during morning and evening peak hours (370 trips total) (ICI Agricultural Products 1989). ICI has roughly 450 employees that work different shifts. Delivery trips are expected to be substantially less and are expected to occur mainly in the midday period.

The number of trips generated by the field station fluctuates. The number of people at the field station each day varies from 150 to 300 depending on the research projects that are active. Because many of the research projects employ graduate students, the total number of people at the field station is dependent on class and vacation schedules. Also, most of the researchers are not at the field station on a daily basis, because of class schedules. In addition, the University of California Extension program occasionally offers classes at the field station. Deliveries also account for some of the field station's trips. Given these variables, the number of trips using the main gate of the Richmond Field Station varies from 250 to 600 each day. Most of these occur during standard working hours.

Regatta Boulevard at South 32nd Street

The most recent traffic counts in the vicinity of the field station were obtained on the east-west segment of Regatta Boulevard, near the intersection with South 32nd Street. The counts were collected in May 1989 (Table 6-1).

The 24-hour count for Regatta Boulevard is 3,743. The typical morning and evening peak hour (6:30 a.m.-8:30 a.m. and 4:30 p.m.-6:30 p.m.) averages are 174 and 260 vehicles per hour, respectively. The midday average (10:30 a.m.-2:30 p.m.) is 335 trips per hour. Consumers visiting the Price Club, located at the northwest corner of the intersection of Regatta Boulevard and South 32nd Street, cause the peak volume to occur in the midday hours. The volume to capacity ratio (V/C) of traffic on Regatta Boulevard is currently around 0.40 (City of Richmond Public Works Department 1989).

Public Transportation

Public transportation is provided by Alameda County (AC) Transit. AC Transit bus route number 10 provides service every 30 minutes from the El Cerrito del Norte BART station along Cutting Boulevard to East Montgomery Avenue, near the entrance to ICI, during peak or commute hours. The number 78 bus provides service between 6:00 a.m. and 10:00 p.m. every 20 minutes from the Richmond BART station to 32nd Street and Cutting Boulevard. Use of this route by field station employees would require patrons to cross I-580.

The Comprehensive Service Plan (a master plan for AC Transit) recommends expanding bus route 10 to provide service at 30-minute intervals from 6 a.m. to 10 p.m. (Markowitz 1989).

Shuttle Bus Service

The University of California operates a shuttle bus service between the Berkeley campus and the field station. The first shuttle leaves the Berkeley campus from the Hearst Mining Circle (northwest part of campus) at 7:35 a.m. and arrives at the field station at 7:55 a.m. Beginning at 9:10 a.m., the shuttle bus leaves Hearst Mining Circle on an hourly schedule until 4:10 p.m. The last bus leaves the field station at 5:00 p.m. and arrives at the Berkeley campus at 5:30 p.m. The shuttle bus operates Monday through Friday only.

Bicyclist and Pedestrian Access

Persons move around the field station on foot and by bicycle, although very few (if any) persons use these modes to travel to the field station. This is mainly because the field station is surrounded by industrial and commercial land uses. Few residential areas are located near the field station except for the Marina Bay residential complex and the

Richmond Annex, located in the southeast corner of Richmond, north of I-580. The industrial land uses create the impression of a lack of safety and isolation, and the distance factor is a hindrance to biking and walking to work. According to the Richmond Police Department, the industrial portions of Richmond are relatively safe.

In addition, physical barriers to nonautomobile transport restrict pedestrian and bicyclist access. The San Francisco Bay prohibits access from the south and the railroad tracks and I-580 limit access from the north and east. In addition, no designated bicycle or pedestrian paths were observed in the vicinity of the field station.

The City of Richmond and the Bay Conservation and Development Commission have planned a shoreline path (i.e., the regional shoreline trail that will eventually encircle the bay) extending through Richmond and the field station. The trail route would follow the Santa Fe Railroad right-of-way just south of the field station. The plan proposes a pedestrian access trail to the field station and vehicle access and parking southwest of the Bayview overcrossing. Implementation of this plan would increase and facilitate bicycle access to the field station (The Planning Collaborative, Inc. 1988).

Parking

Parking is scattered throughout the field station in small parking lots to provide ready access to each building. Only 50 percent of the field station's parking capacity is used on a typical weekday (Markowitz 1989).

The City of Richmond zoning ordinance recommends that one parking space be developed for every 350 square feet of gross floor area of laboratory activities (City of Richmond Planning Department 1988).

Railroad Lines

Several different railroads operate in the vicinity of the field station. Southern Pacific has a railyard northwest of the field station (Figure 3-1); the Santa Fe Railroad line runs along the San Francisco Bay shoreline south of the field station; the Safeway distribution center has a railyard; and ICI America uses a spur. Trains cross Meade Street on an at-grade crossing near the field station. When a train is using this crossing, access between the Regatta/Erlandson overcrossing and the field station is blocked. This could cause serious traffic congestion given development plans for the south shore area (Markowitz 1989a).

ENVIRONMENTAL CONSEQUENCES

Roadway Network

The EPA laboratory would have one main access point, located at the existing main gate. Deliveries would be handled through gate 3. This access is equivalent to the existing circulation system. Implementation of the proposed project would not change the existing roadway network.

Conclusion:

- o Impact finding: Implementation of the proposed project would not change the existing roadway network.
- o Significance: None assigned.
- o Mitigation measures: None required.

Trip Generation

Operation of the EPA laboratory would increase the number of persons at the field station by approximately 25. Following a 25-percent expansion planned for the laboratory, the total number of EPA laboratory employees would rise to 40. As previously stated, the field station's existing population fluctuates between 150 and 300 persons. The proposed project is expected to add approximately 100 trips to roads in the vicinity of the field station, including the interior network of field station roads: South 46th Street, Meade Street, Seaver Avenue, Regatta Boulevard, and Bayview Street. Most of these trips also would use I-580 at some point.

Forty (maximum) of the EPA trips would occur during the morning peak period and an additional 40 trips would occur during the evening peak volume. The remaining 20 trips would occur throughout the day, mainly during the midday period. When compared to the existing traffic that uses the main gate of the field station (i.e., 250-600 trips per day), the proposed project would equal roughly 15-25 percent of the field station's traffic at project buildout (includes expansion). Fifteen to 25 percent is a substantial increase over existing levels, but existing levels are relatively low. The addition of 100 trips each day through the main gate is not considered significant.

According to the City of Richmond Public Works Department, excess capacity on Regatta Boulevard and other streets in the vicinity of the site would be ample to support traffic generated by the project.

Conclusion:

- o Impact finding: Operation of the EPA laboratory would result in the addition of roughly 100 vehicle trips to the roadways in the vicinity of the project site.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Public Transportation, Bicycles, and Pedestrians

Implementation of the proposed project would not affect the ability of AC Transit to provide adequate service to the area because bus route 10 has low ridership and is capable of accommodating EPA employees, if necessary.

Conclusion:

- o Impact finding: Implementation of the proposed project would not affect the ability of AC Transit to provide adequate service to the area.
- o Significance: Less than significant.
- o Mitigation measures: None required.

The project is not expected to increase use of bicycles or pedestrian access. The project would also not inhibit development of the regional shoreline path, as planned, along the Santa Fe Railroad right-of-way. Implementation of this path would increase nonmotorized access to the site.

Parking

Proposed Parking Spaces

A 38-car parking lot would be constructed as part of this project. An additional five parking spaces would be provided as part of a future expansion of the laboratory. Thus, parking would be provided for all of the lab employees (40 employees at buildout) with several extra spaces for occasional visitors. The 43 parking spaces (at full project buildout) may be slightly less than would be needed by employees and visitors.

Conclusion:

- o Impact finding: The 43 parking spaces (at project buildout) may be slightly less than would be needed by employees and visitors.

- o Significance: Less than significant.
- o Mitigation measures: 6.1 Provide a total of 48 parking spaces to accommodate both employees and visitors.

Consistency with the Richmond Zoning Ordinance

The City of Richmond Special Industrial District zoning ordinance requires one parking space for every 350 square feet of lab space. Given the gross square footage of the proposed EPA laboratory (45,855 square feet with an expansion to 50,000 square feet) the project should have 131-143 parking spaces. Thus, the proposed project is inconsistent with parking requirements in the Richmond zoning ordinance. However, given the laboratory's total number of employees, the zoning ordinance requirement is excessive.

The laboratory is expected to employ 25 persons initially and gradually expand to 40 employees as the lab becomes totally functional (Husby pers. comm.), so 43 spaces is only marginally inadequate for the maximum number of people expected at the laboratory on a given day. The zoning ordinance inconsistency is considered less than significant because the number of parking spaces roughly corresponds to the maximum number of employees and because the field station currently has a fair amount of unused parking.

Conclusion:

- o Impact finding: The proposed project is inconsistent with the Richmond zoning ordinance parking requirements for laboratory land uses.
- o Significance: Less than significant.
- o Mitigation measures: 6.1 Provide a total of 48 parking spaces to accommodate both employees and visitors.

MITIGATION MEASURES

6.1 Provide a Total of 48 Parking Spaces to Accommodate Both Employees and Visitors

The number of parking spaces should be increased from 43 to 48 to accommodate both the EPA laboratory employees and visitors.

CHAPTER 7. Air Quality

AFFECTED ENVIRONMENT

Climate

Meteorological conditions in the Richmond shoreline area are influenced by the proximity of the San Francisco Bay, the Pacific Ocean, and the Oakland-Berkeley Hills. Air circulation through this area is good because cool marine winds flow from the ocean across the bay. The prevailing winds along the south Richmond shoreline are southeasterly and southwesterly with an average wind speed of 6-7 miles per hour. Average annual daily temperatures vary between 63°F in summer to 49°F in winter. Average annual precipitation is 24 inches per year.

State and Local Air Quality Regulatory Agencies

The California Air Resources Board (ARB) coordinates federal and state air pollution control programs in California. The ARB monitors air quality, establishes state standards, and compiles state implementation plans (i.e., air quality plans used to attain federal ambient air quality goals). The ARB, along with the federal government, has established ambient air quality standards for ozone, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, and particulate matter. The federal and state ambient air standards for these critical pollutants are listed in Table 7-1.

Much of the Bay Area, including the City of Richmond, is considered part of the San Francisco Air Basin and is within the jurisdiction of the BAAQMD. Existing air quality is monitored by BAAQMD in Richmond, approximately 3 miles from the Richmond Field Station. BAAQMD has permit authority over stationary source emissions and the use of large amounts of hazardous materials which may potentially be emitted into the atmosphere.

Applicable Richmond Zoning Ordinance

The project site is located in Richmond's special industrial zone. The special industrial zoning ordinance:

> prohibits continuous, frequent, or repetitive odors which are perceptible on or beyond adjacent property lines. An odor detected less than 15 minutes in

Table 7-1. Ambient Air Quality Standards Applicable in California

Pollutant	Symbol	Averaging Time	Standard, as parts per million		Standard, as micrograms per cubic meter		Violation Criteria	
			California	National	California	National	California	National
Ozone	0_3	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than
		1 hour	20	35	23,000	40,000		1 day per year
(Lake Tahoe only)		8 hours	6	--	7,000	--		
Nitrogen dioxide	NO_2	Annual average	--	0.053	--	100	If exceeded	If exceeded
		1 hour	0.25	--	470	--		
Sulfur dioxide	SO_2	Annual average	--	0.03	--	80	If exceeded	If exceeded
		24 hours	0.05	0.14	131	365		If exceeded on more than
		1 hour	0.25	--	655	--		1 day per year
Hydrogen sulfide	H_2S	1 hour	0.03	--	42	--	If equaled or exceeded	
Vinyl chloride	$C_2l_3C_l$	24 hours	0.010	--	26	--	If equaled or exceeded	
Particulate matter, 10 microns or less	PM10	Annual geometric mean	--	--	30	--	If exceeded	
		Annual arithmetic mean	--	--	--	50		If exceeded
		24 hours	--	--	50	150		If exceeded on more than 1 day per year
Sulfate particles	SO_4	24 hours	--	--	25	--	If equaled or exceeded	
Lead particles	Pb	Calendar quarter	--	--	--	1.5	If equaled	If exceeded on more than
		30 days	--	--	1.5	--	or exceeded	1 day per year

Notes: All standards are based on measurements at 25° C and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
The California 24-hour standard for SO_2 applies only when state 1-hour 0_3 or 24-hour PM10 standards are being violated concurrently.

any one day is not considered to be continuous, frequent or repetitive in regard to this regulation [City of Richmond Planning Department 1988].

Air Quality Management

The federal Clean Air Act requires states to identify areas that violate any federal primary air quality standards for ozone, CO, nitrogen dioxide, sulfur dioxide, and total suspended particulate matter. Air quality management plans must be prepared and implemented for such nonattainment areas (i.e., air basins that have exceeded federal or state standards). The entire San Francisco Air Basin is classified as a nonattainment area for ozone and CO.

Carbon Monoxide

CO is primarily a winter air pollution problem. Motor vehicle emissions are the dominant source of CO in most areas. As a directly emitted pollutant, CO is transported away from the emission source accompanied by dispersion and reduced pollutant concentrations. Consequently, CO problems are usually localized, often the result of a combination of high traffic volumes and significant traffic congestion.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour CO standard is 20 ppm, while the federal 1-hour CO standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period. State CO standards are values not to be exceeded. Federal CO standards are values not to be exceeded more than once per year.

Ozone

Ozone, the main component of photochemical smog, is primarily a summer and fall pollution problem. Ozone is not emitted directly into the air, but is formed through a complex series of chemical reactions involving other compounds (including various organic compounds, nitric oxide, and nitrogen dioxide) that are directly emitted. The long time required for these reactions allows the reacting compounds to be spread over a large area, producing a regional pollution problem. Ozone problems are the cumulative result of regional development patterns, rather than the result of a few incrementally significant emission sources.

The state 1-hour ozone standard is 0.10 ppm, not to be equaled or exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period.

Existing Air Quality Problems in Richmond

The potential for the accumulation of pollutants is lower in the vicinity of the field station, as compared to other parts of the Bay Area, because of the frequent strong winds occurring in the area. Richmond has rarely exceeded state and federal ambient air quality standards, unlike other locations in the San Francisco Air Basin. Since 1981, Richmond has had one air pollution violation: the state ozone standard was exceeded in 1983. No violations of the remaining ambient air quality standards were documented by BAAQMD between 1981 and 1988 (Table 7-2) (California Department of Health Services 1989).

Emissions in the Richmond area are mainly from automobiles traveling in Richmond, Berkeley, and Oakland, and from the industrial land uses in Richmond. Chemical plants, petroleum processing, and rock-crushing operations located north and northeast of the field station are considered major point sources for air pollution emissions in the Bay Area (Baseline Environmental Consulting 1986).

ICI, located adjacent to the east border of the field station, emits approximately 0.5 pound of organic compounds (mostly acetone) each year. Trace amounts of other solvents, chemically related to kerosene, are occasionally emitted by ICI. The emissions do not exceed BAAQMD standards, although BAAQMD does not have standards for acetone and kerosene. ICI estimates that approximately 0.5 pound of dust is emitted each year, including 0.45 pound of inert material and 0.05 pound of active material (ICI Agricultural Products 1989).

Air Quality Standards for Toxic Air Pollutants

Few standards exist for emission of hazardous materials into the atmosphere. The National Emissions Standards for Hazardous Air Pollutants provide federal ambient air quality standards for the emissions of nine toxic substances: arsenic, asbestos, benzene, beryllium, cadmium, coke oven emissions, mercury, radionuclides, and vinyl chloride.

ENVIRONMENTAL CONSEQUENCES

Construction-Related Emissions

The project would replace two existing storage buildings (buildings 126 and 131), two vacant buildings (buildings 129 and 200), and a solid waste recycling research and development operation (building 128) with a 45,855-square-foot laboratory, an auxiliary storage building, and a parking lot. The five onsite buildings would be demolished as part of the project. Construction and demolition activities would produce direct emissions from construction equipment and dust from soil disturbance. These construction activities could affect research activities in the vicinity of the site that use air filters to remove total suspended particulate matter. The particulate matter could also clog air filters.

Table 7-2. Summary of Carbon Monoxide and Ozone Monitoring Data for the Richmond Monitoring Station

	Parameter	Carbon Monoxide 1985	1986	1987	1988	Ozone 1985	1986	1987	1988
Richmond	Peak 1-hour value (ppm)	8.0	10.0	8.0	8.0	0.09	0.07	0.09	0.07
	Peak 8-hour value (ppm)	4.3	5.0	4.8	5.9	N/A	N/A	N/A	N/A
	Days above standards	0	0	0	0	0	0	0	0

Notes: N/A = Not applicable.
ppm = Parts per million by volume.
Federal 1-hour carbon monoxide standard is 35 ppm; state 1-hour carbon monoxide standard is 20 ppm.
Federal and state 8-hour carbon monoxide standards are 9 ppm.
Federal 1-hour ozone standard is 0.12 ppm; state 1-hour ozone standard is 0.09 ppm.

Source: California Air Quality Data 1985-1988.

Conclusion:

- o Impact finding: Dust generated by construction activities could affect adjacent research operations.
- o Significance: Less than significant.
- o Mitigation measures: 7.1 Reduce dust at the construction/demolition site with water trucks.

Since most of the structures on the site are fairly old, some may possibly be insulated with materials containing asbestos. The EPA requires removal of "asbestos-containing materials" (ACMs) prior to demolition of structures. If asbestos is not removed before demolition, asbestos could potentially be emitted into the atmosphere. Since asbestos fibers are a known carcinogen, this could result in a health hazard and is thus identified as potentially significant.

Conclusion:

- o Impact finding: Older structures on the project site may contain ACMs which could be released into the atmosphere during demolition activities.
- o Significance: Potentially significant.
- o Mitigation measures: 7.2 Remove all asbestos-containing materials prior to demolition of structures.

Operational Impacts

Increased Vehicle Trips

Project implementation would increase both morning and evening peak-hour vehicle trips by a maximum of 40 trips for each period (i.e., a total of 80 over the course of the day). These numbers are based on a staff of 40 employees at buildout. A small amount of trips (roughly 10-20) during nonpeak hours would result from deliveries and other miscellaneous tasks. Vehicle emissions would primarily increase carbon monoxide concentrations. The increase is expected to be less than significant because of the small number of vehicle trips generated by the project. The added vehicle trips are not expected to cause ambient air quality standards to be exceeded in Richmond.

Conclusion:

- o Impact finding: The project would result in approximately 100 additional vehicle trips each day in the vicinity of the

field station. These trips would increase carbon monoxide levels in Richmond.

- o Significance: Less than significant.
- o Mitigation measures: None required.

The increase in vehicle trips would result in less-than-significant impacts on regional air quality. No mitigation is recommended.

Conclusion:

- o Impact finding: The project would have little affect on regional air quality.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Emission of Toxic Air Pollutants by the U. S. Environmental Protection Agency Laboratory

As previously noted in Chapter 5, the EPA laboratory would use hazardous materials in lab procedures. Table 5-2 presents a preliminary list of hazardous materials expected to be handled.

To reduce the potential for emission of hazardous pollutants, the EPA laboratory would be equipped with fume hoods to collect toxic fumes. These emissions would then be filtered in a 99-percent filtration process and the filtered air would be released into the atmosphere. Because of the efficient filtration process, the potential for release of hazardous materials into the environment is expected to be less than significant.

Conclusion:

- o Impact finding: The project could result in a minimal amount of hazardous materials being emitted into the atmosphere through the fume hoods.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Bay Area Air Quality Management District Permit

The BAAQMD requires acquisition of construction and operation permits for projects with equipment that may cause air pollution. Permitting for operations that may release hazardous materials into the atmosphere is also required for projects that use

certain quantities of hazardous materials. However, research laboratories are typically exempt from this permit. Exemption would be determined following consultation with the BAAQMD.

Conclusion:

- o Impact finding: The project may require air quality permits from the BAAQMD depending on the potential for equipment to cause air pollution, and the quantities of hazardous materials to be used at the laboratory.
- o Significance: None assigned.
- o Mitigation measures: Consult with the BAAQMD concerning the potential need for a permit for equipment that may cause air pollution and for the potential release of hazardous materials into the atmosphere.

MITIGATION MEASURES

7.1 Reduce Dust at the Construction/Demolition Site with Water Trucks

Methods to reduce generation of dust (i.e., total suspended particulate matter) should be employed during construction and demolition activities, particularly those activities occurring near existing buildings.

7.2 Remove All Asbestos-Containing Materials Prior to Demolition of Structures

The university should remove all asbestos-containing materials (if any exist on site) prior to demolition of structures.

7.3 Consult with the Bay Area Air Quality Management District Concerning the Potential Need for a Permit for Equipment That May Cause Air Pollution and for the Potential Release of Hazardous Materials into the Atmosphere

The EPA should consult with the BAAQMD regarding the possible need for a BAAQMD permit for the release of hazardous materials into the atmosphere.

CHAPTER 8. Noise

NOISE TERMINOLOGY AND MEASUREMENTS

Decibels and Decibel Scales

Sound travels through the air as waves of minute air pressure fluctuations caused by some type of vibration, the noise source. In general, sound waves travel away from the noise source as an expanding spherical surface. The energy contained in a sound wave consequently spreads over an increasing area as it travels away from the source. This spreading results in a decrease in loudness at greater distances from a noise source.

Sound-level meters measure the actual pressure fluctuations caused by sound waves, with separate measurements made for different sound frequency ranges. These measurements are reported in a logarithmic decibel (dB) scale. Most sounds consist of a broad range of sound frequencies. Because the human ear is not equally sensitive to all frequencies, several frequency-weighting schemes have been used to develop composite decibel scales that approximate the way the human ear responds to noise levels. The A-weighted decibel scale (dBA) is the most widely used for this purpose. Table 8-1 illustrates the dBA levels associated with common noise sources.

Varying noise levels are often described in terms of the equivalent constant decibel level. Equivalent noise levels (Leq) are used to develop single-value descriptions of average noise exposure over various periods of time. Such average noise exposure ratings often include additional weighting factors for annoyance potential due to time of day or other considerations. The Leq data used for these average noise exposure descriptors are generally based on A-weighted sound level measurements.

Average noise exposure over a 24-hour period is often presented as a day-night average sound level (Ldn). Ldn values are calculated from hourly Leq values, with the Leq values for the nighttime period (10 p.m.-7 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime noises.

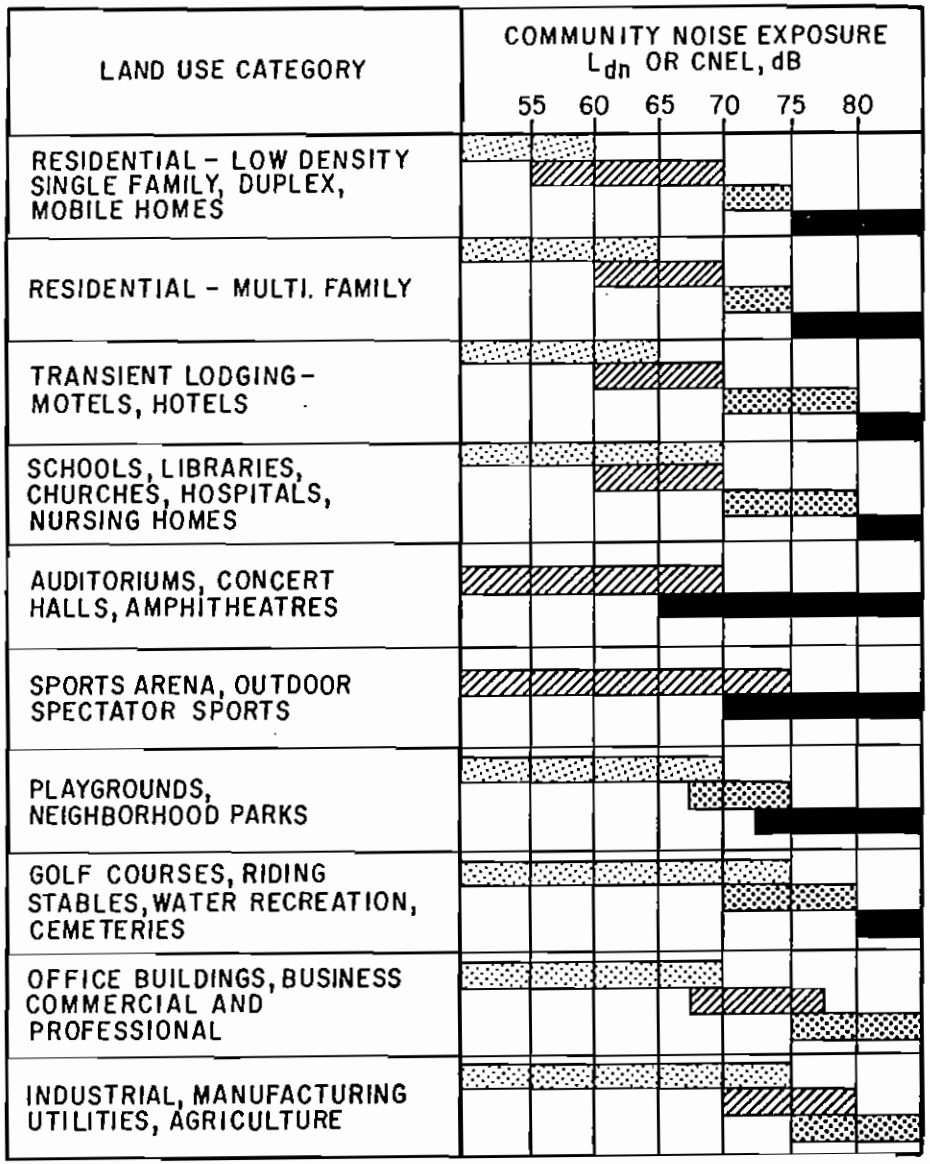
The community noise equivalent level (CNEL) characterizes average noise levels over a 24-hour period, with weighting factors for evening and nighttime noise levels. Leq values for the evening period (7 p.m.-10 p.m.) are increased by 5 dB, while Leq values for the nighttime period are increased by 10 dB. Except in unusual situations, the CNEL descriptor will be within 1.5 dB of the Ldn descriptor for the same set of noise measurements.

Table 8-1. Weighted Sound Levels and Human Response

Sound Source	dB(A)*	Response Criteria
	- 150	
Carrier deck jet operation	- 140	
		Painfully loud
	- 130	Limit amplified speech
Jet takeoff (200 feet)	- 120	
Discotheque		Maximum vocal effort
Auto horn (3 feet)		
Riveting machine	- 110	
Jet takeoff (2,000 feet)		
Shout (0.5 foot)	- 100	
N. Y. subway station		Very annoying
Heavy truck (50 feet)	- 90	Hearing damage (8 hours)
Pneumatic drill (50 feet)		
	- 80	Annoying
Freight train (50 feet)		
Freeway traffic (50 feet)	- 70	Telephone use difficult
		Intrusive
Air conditioning unit (20 feet)	- 60	
Light auto traffic (50 feet)		
	- 50	Quiet
Living room		
Bedroom	- 40	
Library		
Soft whisper (15 feet)	- 30	Very quiet
Broadcasting studio	- 20	
	- 10	Just audible
	- 0	Threshold of hearing

* Typical A-weighted sound levels taken with a sound-level meter and expressed as decibels on the scale. The "A" scale approximates the frequency response of the human ear.

Source: U. S. Council on Environmental Quality 1970.



INTERPRETATION

NORMALLY ACCEPTABLE

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE

New construction or development should generally not be undertaken.

TABLE 8-2. LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS

Source: California Department of Health Services 1987

Working with Decibel Values

Individual dB ratings for different noise sources cannot be added directly to give the dB rating of the combination of these sources. Two noise sources producing equal dB ratings at a given location will produce a composite noise level 3 dB greater than either sound alone. When two noise sources differ by 10 dB, the composite noise level will be only 0.4 dB greater than the louder source alone. Most people have difficulty distinguishing the louder of two noise sources that differ by less than 2 dB. In general, a 10-dB increase in noise level is perceived as a doubling in loudness. A 2-dB increase represents a 15-percent increase in loudness.

When distance is the only factor considered, sound levels from an isolated noise source will decrease by about 6 dB for every doubling of distance from the noise source. When the noise source is essentially a continuous line (e.g., vehicle traffic on a highway), noise levels decrease by about 3 dB for every doubling of distance.

AFFECTED ENVIRONMENT

Federal Agency Guidelines

EPA (1974) has identified indoor and outdoor noise limits to protect public health and welfare "with an adequate margin of safety." Ldn values of 55 dB outdoors and 45 dB indoors are identified as desirable for residential, educational, and health care areas. Noise level criteria for commercial and industrial areas are identified as 24-hour Leq values of 70 dB, both outdoors and indoors.

State Agency Guidelines

The California Department of Health Services has published guidelines for the noise element of local general plans. These guidelines include a noise level/land use compatibility chart (Figure 8-2) that categorizes various outdoor Ldn ranges into four compatibility categories (normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable) depending on land use. For many land uses, the chart shows overlapping Ldn ranges for two or more compatibility categories. These overlapping Ldn ranges indicate that local conditions, such as existing noise levels and community attitudes toward dominant noise sources, should be considered in evaluating land use compatibility at specific locations.

City of Richmond Noise Element

The primary objectives of the Richmond noise element include:

- o identifying areas subject to excessive or annoying transportation noises, and
- o establishing mechanisms to minimize excessive noise impacts.

The general plan policies instruct the city to limit noise resulting from vehicles and railroad operations and to document existing noise conditions.

City of Richmond Municipal Code

The city identifies general noise regulations in the Richmond Municipal Code, (Section 9.22.040). In addition, the *Zoning Ordinance of the City of Richmond* addresses noise levels for each zone, including Special Industrial Districts. Section 15.04.145 of the zoning code requires that

> no continuous, frequent, or repetitive noises are permitted which are detectable on or beyond adjacent property lines and which exceed 56 dBA. A noise of no more than five minutes in any one day shall not be deemed continuous, frequent, or repetitive for this regulation. Areas of significant potential noise generation, e.g., loading docks, truck parking areas, garbage and trash collection and exterior activity areas, etc., shall be so designed that adjacent properties, especially those of a residential character, will not be adversely affected by sound.

Ambient Noise

The project site is in a somewhat noisy industrial area but is far removed from industrial activities, which results in a relatively quiet site with faint background noise. Sources of ambient noise include distant traffic from I-580, construction, and birds. Occasional use of Southern Pacific Railroad lines in the vicinity of the site also contribute to the ambient noise level. Daytime noise levels on the project site range from about 45 to 55 dBA. The nearest sensitive receptor in the vicinity of the project site is the Marina Bay residential development, located about 500-1,000 feet southwest of the project site.

ENVIRONMENTAL CONSEQUENCES

Construction Noise

Construction equipment and activities typically generate noise levels of 85-90 dBA at a distance of 50 feet, 75-85 dBA at a distance of 100 feet, and 65-75 dBA at a distance of 200 feet from the noise source. Construction noise would mainly affect offices connected with the Naval Architecture and Offshore Engineering Department and the Sanitary Engineering and Environmental Health Research Laboratory. These land uses are about 100-200 feet from the project site. Project construction is expected to generate noise levels of 60-80 dBA. The eucalyptus windbreak would attenuate the noise reaching the Naval Architecture and Offshore Engineering Department. These operations are not considered to be sensitive receptors, but individuals working in these facilities throughout the day would probably find the construction noise annoying.

Construction activities are not expected to affect the Marina Bay residential development because occupied portions of the residential development are no closer than 1,000 feet from the site. The Marina Bay development is the only sensitive receptor in the vicinity of the project site.

Conclusion:

- Impact finding: Project construction is expected to expose adjacent land uses to noise levels of 60-80 dBA.
- Significance: Less than significant.
- Mitigation measures: 8.1 Schedule construction activities for hours when fewer employees are expected to be at the field station.

Operation Noise

Operation of the EPA laboratory is expected to generate noise from the ventilation system and the boiler building. The noise from these sources would be diffused by walls and other project design features and is thus expected to be insignificant.

Conclusion:

- Impact finding: Noise from operation of the ventilation system and the boiler would have little impact on adjacent land uses.
- Significance: Less than significant.
- Mitigation measures: None required.

Landscape Maintenance

Operation of landscape maintenance equipment, such as lawn mowers and leaf blowers, would create noise for short periods of time. Landscape maintenance already occurs at other parts of the field station. This impact is expected to be less than significant because of the temporary nature of the noise source.

Conclusion:

- o Impact finding: Operation of landscape maintenance equipment would create noise for short periods of time.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Automobile Trips Generated by the Project

Automobile trips generated by the project are not expected to significantly increase traffic noise in the vicinity of the project site.

Conclusion:

- o Impact finding: Additional automobile trips would generate an insignificant amount of noise.
- o Significance: Less than significant.
- o Mitigation measures: None required.

MITIGATION MEASURES

8.1 Schedule Construction Activities for Hours When Fewer Employees are Expected to Be at the Field Station

Construction activities should occur mainly on weekends and during the early morning or late afternoon on weekdays.

CHAPTER 9. Biotic Resources

INTRODUCTION AND APPROACH

Jones & Stokes Associates conducted field surveys for biological resources on August 10, 1989, and on January 5, 1990. Plant communities were described and mapped based on field observations, personal communications, and information from previous surveys (Environmental Collaborative 1989). A survey was also conducted to determine the potential presence of special-status plant and wildlife species, as well as other wildlife species.

Katharine Loughman, a librarian for the Northern Regional Library Facility at the field station, prepared a list of birds observed using the grassland habitat at the field station. This list was based on frequent field surveys by Ms. Loughman and has been included in Appendix B, "Common and Scientific Names of Wildlife Species Potentially Occurring on the Site or Mentioned in the Text."

AFFECTED ENVIRONMENT

For the purposes of this report, project site vegetation has been divided into two types: eucalyptus and mowed grassland. Common and scientific names of plant species mentioned in this report are presented in Appendix C.

Eucalyptus

Vegetation

Mature blue gum eucalyptus form a stand at the field station that extends into the project site. Approximately 20-30 eucalyptus trees (part of a larger stand) are located north of building 128, as shown in Figure 9-1. Volatile chemicals such as tannins, that leach from the eucalyptus debris (or duff), inhibit understory growth beneath the trees.

Several small eucalyptus saplings have been planted for landscaping along Heron Drive, west of building 128.

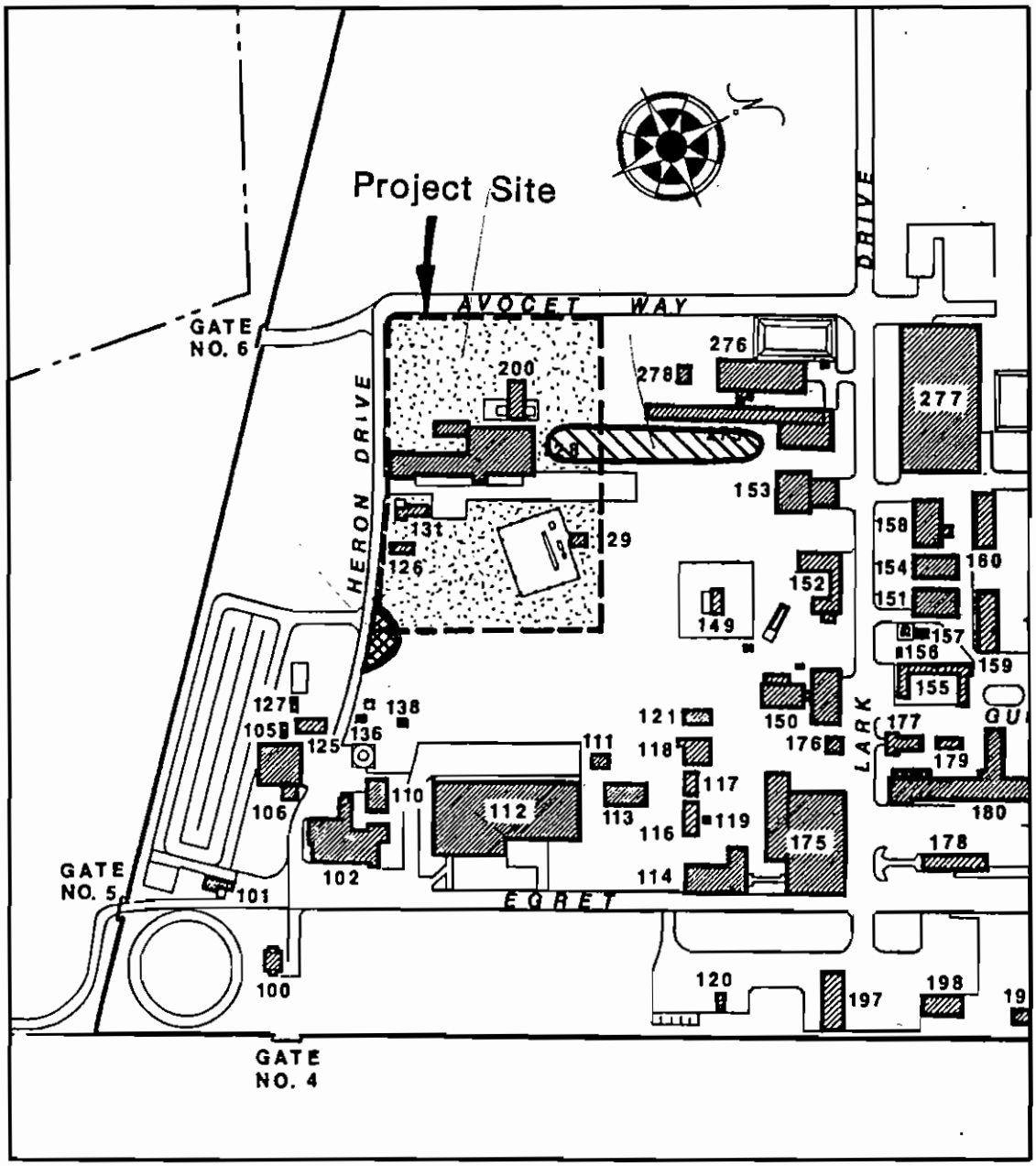


FIGURE 9-1. PROJECT SITE VEGETATION, RICHMOND FIELD STATION

Wildlife

The eucalyptus stand at the field station provides good-quality wildlife habitat because the grove is near other communities, including coastal prairie, annual grassland, and tidal salt marsh. The juxtaposition of different habitat types makes the communities more valuable collectively than individually.

The eucalyptus trees provide important perching, roosting, and nesting substrate for numerous species of birds, including raptors. Red-tailed hawk, great horned owl, and black-shouldered kite have active nest sites in eucalyptus trees at the field station, foraging in the surrounding grassland and marshland habitat (Environmental Collaborative 1989). No raptor nests have been observed on the project site. Other birds that use the eucalyptus include hummingbirds, warblers, sparrows, and finches.

Mowed Grassland

Vegetation

Vacant parcels adjacent to existing structures support grassland that is mowed periodically. On the survey days, these areas supported grass stubble and associated forbs. Most of the grass species were not identifiable. Identifiable species present in the mowed grassland included wild oats, soft chess, ryegrass, ox-tongue, English plantain, mustard, and fennel.

A small patch of saltgrass was identified in the southeastern corner of the project site on the lowest portion of the site. The western half of the project site appears to drain to this corner, helping to support the saltgrass, a facultative wetland species. A centrally located portion of the mowed grassland southeast of building 129 is dominated by what appears to be native bunchgrasses consisting of either purple needlegrass or squirreltail grass. Since the site has been mowed, a positive identification was impossible.

Wildlife

The mowed grassland is not as valuable to wildlife species as native grassland or even introduced annual grassland because of the considerable disturbance to the plant community. Mowed grassland can support some of the species typically found in annual grassland, but in fewer numbers. It provides foraging habitat for small mammals and birds and is occasionally used by raptors for foraging.

Wildlife species commonly found in annual grassland that probably reside in the project site's mowed grassland include California vole, Botta's pocket gopher, western harvest mouse, California ground squirrel, common garter snake, and gopher snake (Environmental Collaborative 1989).

Several raptor species, including red-tailed hawk, black-shouldered kite, northern harrier, American kestrel, and great horned owl, forage throughout the field station

grasslands. These species forage mainly in the fields west of Avocet Way and east of building 280. American kestrels are frequently seen perched on the power lines along Avocet Way. Other birds commonly observed on the project site include killdeer, rock dove, mourning dove, black phoebe, Brewer's blackbird, and house finch.

Special-Status Plant Species

For the purpose of this report, special-status plants include species in the following categories:

- species that are currently listed, proposed for listing, or candidates under review for listing as threatened or endangered under the federal Endangered Species Act (50 FR 39526-39584);
- species that are currently listed, proposed for listing, or candidates under review for listing as rare, threatened, or endangered under the California Endangered Species Act (California Department of Fish and Game 1989); and
- species that are considered "rare, threatened, or endangered in California and elsewhere" by the California Native Plant Society (Smith and Berg 1988).

A search of the California Department of Fish and Game (DFG) Natural Diversity Data Base (NDDB) (1989) uncovered no documented occurrences of special-status plant species on the project site. Suitable habitat is present on the project site for only one of the three species recorded by NDDB for the region: the Santa Cruz tarweed. No individuals of Santa Cruz tarweed were observed during the field surveys, and none were reported in surveys earlier this year (Environmental Collaborative 1989).

Special-Status Wildlife Species

For the purpose of this report, special-status wildlife include species from the following categories:

- species that are federally listed, proposed, and candidate threatened or endangered wildlife (50 CFR 17.11 and 17.12 and 54 Federal Register 554-579);
- State of California-listed, threatened and endangered species (California Administrative Code, Title 14, Section 670.5);
- California fully protected species (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]); and
- California species of special concern (Remsen 1978 and Williams 1986).

The project site is within the geographic ranges of several special-status wildlife species (Table 9-1). Most of these species are associated with the tidal salt marsh, located 250-400 feet south of the project site. The status of these species at the project site is briefly summarized below.

Special-Status Wildlife Species Associated with Tidal Wetlands

The California black rail, California clapper rail, salt marsh vagrant shrew, salt marsh wandering shrew, San Pablo vole, and salt marsh harvest mouse are typically found in salt marshes and use adjacent herbaceous upland habitats as escape cover during high tides. The salt marsh at the project site provides suitable breeding habitat for these species, and the upland non-native grassland (immediately adjacent to the salt marsh) provides suitable escape cover. The nearest known population for these species is approximately 4-5 miles northwest of the field station (Environmental Collaborative 1989).

Even though these species use upland communities adjacent to marshland, they usually do not venture far from the edge of the water. The salt marsh harvest mouse, for example, typically travels less than 20 feet from the shoreline and is rarely willing to cross a levee, particularly if the levee is lacking cover. Given the distance between the field station's tidal salt marsh and the project site, these species are not expected to be found on the project site.

The common yellowthroat was identified in the grassland at the field station (Loughman pers. comm.), but the common yellowthroat is not found along the San Francisco Bay shoreline. A subspecies of the common yellowthroat, the saltmarsh yellowthroat, is found along the San Francisco Bay shoreline, typically in emergent marsh and riparian vegetation. The saltmarsh yellowthroat may also occupy upland vegetation adjacent to the wetland vegetation.

This species is not expected to frequent the project site for several reasons. First, the preferred vegetation structures (i.e., emergent marsh and woodland) are not present on the project site. Second, the project site grassland has been disturbed by mowing and development with structures. Third, the site is relatively far (at least 250 feet) from the tidal marsh, which is the preferred habitat of the saltmarsh yellowthroat (of those habitat types that are available at the field station). The saltmarsh yellowthroat is designated as a federal candidate species for listing as endangered or threatened.

Other Special-Status Wildlife Species

Black-Shouldered Kite. Black-shouldered kites nest in riparian and oak woodlands and in other trees, including eucalyptus. Kites forage in grasslands, mowed grasslands, ruderal fields, wetlands, and agricultural fields. A pair of kites was observed nesting in the eucalyptus grove north of the project site (Environmental Collaborative 1989). Kites are frequently observed foraging in the herbaceous habitats at the field station.

Black-shouldered kites are recognized and monitored as "California fully protected" species by the NDDB under Section 3511 of the state Fish and Game Code. Fully

Table 9-1. Special-Status Wildlife Species Potentially Occurring at the Richmond Field Station

Species	Legal Status[a] Federal/State	Preferred Habitat	Potential for Regular Occurrence at the Project Site
Black-shouldered kite	--/CFP	Grasslands, wetlands	High
Northern harrier	--/SSC	Wetlands, grasslands	High
California black rail	FC/ST	Coastal salt marsh	None
California clapper rail	FE/SE	Coastal salt marsh	None
Salt marsh vagrant shrew	FC/SSC	Coastal salt marsh	Low to none
Salt marsh wandering shrew	FC/SSC	Coastal salt marsh	Low to none
San Pablo vole	FC/--	Coastal salt marsh and adjacent areas	Low
Salt marsh harvest mouse	FE/SE	Coastal salt marsh	None

[a] Status definitions:

FE = Federally listed as endangered.
FC = Federal candidate for listing.
ST = State listed as threatened.
SE = State listed as endangered.
SSC = State species of special concern.
CFP = California fully protected.

Source: Natural Diversity Data Base 1989.

protected birds may not be taken or possessed except as authorized by the DFG (Environmental Collaborative 1989).

Northern Harrier. Northern harriers require dense wet meadows and grasslands for nesting and foraging (Call 1978). The coastal prairie and annual grassland at the field station provide nesting and foraging habitat for the harrier (Environmental Collaborative 1989). The mowed grassland of the project site provides marginal foraging habitat because it is near annual grasslands, which are good foraging habitat. Northern harriers have been observed foraging in the field west of Avocet Way during both the breeding and non-breeding seasons.

Northern harriers are classified as "state species of special concern," which are those birds whose breeding populations in the state have declined severely or are otherwise so low that extirpation is a possibility (Remsen 1978).

Monarch Butterfly. Monarch butterflies are also recognized and monitored as a "special animal" by the NDDB. Special animals refers to taxa of concern to NDDB regardless of their legal or protective status. During the winter, as they migrate south, monarch butterflies tend to congregate in large masses at night and feed on the flowering eucalyptus and other species during the day, possibly wintering at the field station and other locations throughout the San Francisco Bay Area. They have been observed in the stands north of Lark Drive and most heavily at the north end of the eucalyptus stand near building 400 (Figure 9-2). The congregation site at the field station has been used by the butterfly since the mid-1960s (Environmental Collaborative 1989 and Natural Diversity Data Base 1989).

Most of the monarch butterflies had apparently left the field station by January. Few monarch butterflies were observed during the January 5 field visit, and no monarch butterflies were observed on the project site. Roughly 15 were identified flying around the smaller eucalyptus northeast of building 400, and two monarch butterflies were observed near building 165.

ENVIRONMENTAL CONSEQUENCES

Eucalyptus

Vegetation

Roughly 20-30 eucalyptus trees would be removed to construct the project. This impact is considered less than significant because the eucalyptus is a hearty, introduced species found throughout California.

Conclusion:

- o Impact finding: The project would require removal of 20-30 eucalyptus trees.

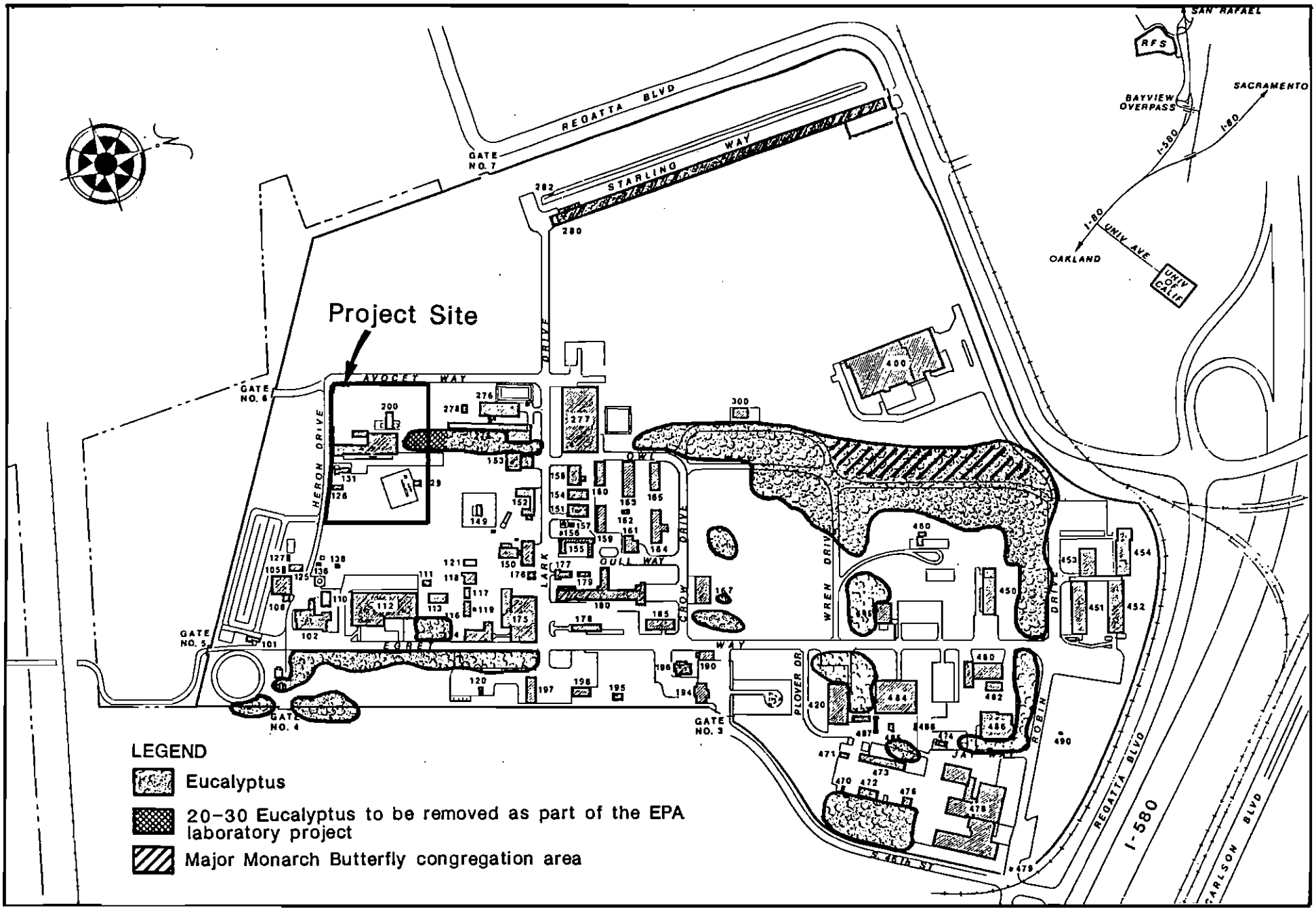


FIGURE 9-2. EUCALYPTUS AT THE RICHMOND FIELD STATION AND MONARCH BUTTERFLY CONGREGATION AREAS

Sources: Environmental Collaborative 1989 and Jones & Stokes Associates

- o Significance: Less than significant.
- o Mitigation measures: None required.

Wildlife

The loss of 20-30 eucalyptus would displace birds using the eucalyptus. This impact is considered less than significant because the birds use the trees at the project site less than they use other eucalyptus on the field station and because other eucalyptus are available for relocation.

Conclusion:

- o Impact finding: The project would displace birds using the eucalyptus.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Mowed Grassland

Vegetation

Approximately 2.0 acres of mowed grassland would be removed to construct the project. Additional grassland acreage would likely be affected by construction and support activities. Adverse impacts on disturbed grassland are considered less than significant because disturbed grasslands and the species associated with them are common throughout California.

Conclusion:

- o Impact finding: The project would require removal of roughly 2.0 acres of mowed grassland.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Wildlife

The loss of mowed grassland habitat at the project site would eliminate or displace wildlife associated with this habitat. This impact is considered less than significant because grasslands are common locally and regionally.

Conclusion:

- o Impact finding: The project would eliminate or displace wildlife associated with the mowed grassland habitat.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Special-Status Species

Vegetation

No special-status vegetation is expected to occur on the project site, and only marginal habitat for special-status plant species exists on the project site.

Conclusion:

- o Impact finding: No special-status vegetation has been identified on the site.
- o Significance: None.
- o Mitigation measures: None required.

Wildlife

Special-Status Species Associated with Tidal Wetlands. The California black rail, California clapper rail, salt marsh yellowthroat, salt marsh vagrant shrew, salt marsh wandering shrew, and salt marsh harvest mouse would not be affected by the project because no direct impacts on the salt marsh and adjacent annual grassland would occur.

Conclusion:

- o Impact finding: The project would not affect special-status species associated with tidal wetlands.
- o Significance: None.
- o Mitigation measures: None required.

Black-Shouldered Kite. The impact on black-shouldered kites is considered less than significant because the reported nest site would not be disturbed by the project. However, some foraging habitat would be eliminated. This loss of foraging habitat is considered less than significant due to its small size and relatively poor quality in its present condition (mowed), as well as the size and quality of foraging habitat adjacent to the site.

Conclusion:

- o Impact finding: The project would eliminate mowed grassland foraging habitat for the black-shouldered kite.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Northern Harrier. Marginal foraging habitat for the northern harrier would be eliminated by the project. This impact is considered less than significant because high-quality coastal prairie and salt marsh foraging habitat occurs near the site.

Conclusion:

- o Impact finding: Marginal foraging habitat for the northern harrier would be eliminated by the project.
- o Significance: Less than significant.
- o Mitigation measures: None required.

Monarch Butterfly. No monarch butterflies have been documented either on the project site or within 500 feet of the site. Thus, elimination of 20-30 eucalyptus trees at the southern end of the grove is not expected to affect the monarch butterflies using the northern portion of the eucalyptus grove.

Conclusion:

- o Impact finding: Removal of 20-30 eucalyptus on the project site is not expected to affect the monarch butterfly.
- o Significance: Less than significant.
- o Mitigation measures: None required.

MITIGATION MEASURES

The EPA laboratory project would not result in significant or potentially significant impacts on the biotic community. Thus, no mitigation measures have been recommended.

CHAPTER 10. Geology and Soils

INTRODUCTION

Most of the information presented in this chapter was obtained from the following sources:

- Shoreline Conservation and Development Strategy Technical Memorandum Number 2, Planning Analysis (Hall, Goodhue, Haisley, and Barker 1986);
- Contra Costa County Soil Survey (U. S. Soil Conservation Service 1977); and
- Richmond Field Station Master Plan Geotechnical Information (Rutherford & Chekene 1989).

AFFECTED ENVIRONMENT

Topography

The City of Richmond is within the Pacific Coast Range geomorphic province. Richmond is located on land that projects into San Pablo Bay, San Pablo Strait, and San Francisco Bay. The San Pablo-Potrero Hills rise to an elevation of 400 feet above sea level along the Richmond shoreline in a northwest direction, abruptly ending just southwest of the Richmond Inner Harbor at Brooks Island. In contrast to the dramatic San Pablo-Potrero Hills, most of the Richmond shoreline (including the proposed project site) is located within the coastal lowlands (Hall, Goodhue, Haisley, and Barker 1986).

Geological Formation

The bedrock underlying the Richmond Field Station consists primarily of graywacke, black shale and slate, greenstone, and chert of the Franciscan Formation. Bedrock is estimated to be about 100 feet below mean lower low water. The bedrock is overlain by fine-grained sedimentary deposits or alluvium from Pleistocene to recent epochs. The alluvial deposit is mainly a mixture of interbedded stiff clays, silts, gravels, and sands (Rutherford & Chekene 1989).

Soils

The coastal lowland areas are composed of deep alluvial soils and bay mud. The alluvium has been deposited at the shoreline by runoff from the hills of the East Bay. The bay mud has been deposited from bay tidal action. Shoreline soils consist of soft, gray silty clay (bay mud), with silt, sand, and gravel (Hall, Goodhue, Haisley, and Barker 1986).

The field station's subsurface soil conditions can be divided into two groups, geographically defined as the areas north and south of the City of Richmond's sewer easement in the vicinity of Heron Drive. (See Figure 4-2 for the sewer alignment.)

A profile of the soils in the area north of the sewer alignment is best represented by the logs of two wells drilled at the Richmond Field Station. The soil layers consisted of stiff, silty clay and sandy clay in the upper 8 feet. The clays are underlain by layers of poorly sorted gravel, sand, and clay to a depth of about 40 feet. Clays and gravelly clay layers were encountered from 40 to 90 feet. Pea gravel was encountered from a depth of 90-102 feet. In some locations in this area highly plastic black clay, which may be expansive, is present in the upper 3-4 feet.

The soil profile in the area south of the sewer alignment consists of a surface layer of artificially placed fill, overlying a deposit of soft gray silty clay, commonly referred to as young bay mud. The young bay mud is underlain by a stiffer deposit of silty clay with interbedded sand and gravel lenses called old bay mud. The old bay mud is, in turn, underlain by layers of sand, gravel, and clays, which overlay bedrock.

The project site lies within the Clear Lake clay soil series, which is a poorly drained, fine-textured alluvium. The predominance of clay in the soil results in a high shrink-swell potential. Runoff is typically slow, and the soil is subject to flooding once every 7-10 years in areas lacking surface drainage (U. S. Soil Conservation Service 1977).

Soil Sampling for Hazardous Wastes

High concentrations of mercury have been identified in the soils near the EPA laboratory project site. The mercury was left from a previous mercury fulminate production facility. This issue is addressed in Chapter 5, "Hazardous Materials."

Landfill

The Richmond shoreline has been altered over the past 100 years as a result of fill activity. Placement of fill material in the field station's shoreline marsh occurred between 1959 and 1968 (Master Plan Geotech). Fill placement at the field station was relatively small scale (less than 15 acres) compared with that at Marina Bay. Between 1930 and 1942 roughly 150 acres of fill was deposited at Marina Bay (Hall, Goodhue, Haisley, and Barker 1986). The project site is located on alluvium approximately 200 feet north of fill placed by the University of California.

Seismicity

Active Faults

Two active faults have the greatest potential to affect the project site: the Hayward Fault and the Wildcat Fault. The Hayward Fault has had major earthquakes registering above 7.0 on the Richter scale in recent history (i.e., 1836 and 1868). Earthquakes of this level are expected at an interval of 50 to 100 years.

The San Andreas Fault, located 15 miles west of Richmond, can also jar Richmond, as evidenced by the October 17 earthquake (7.1 on the Richter scale) centered near Watsonville, California in the Santa Cruz Mountains, approximately 80 miles south of the project site. Groundshaking caused a number of Bay Area structures to collapse, but the field station fared well. Damage was limited to one object falling from a shelf (Bell pers. comm.)

The greatest earthquake on the San Andreas Fault occurred in 1906 and measured greater than 8.0 on the Richter scale. An earthquake of this magnitude may recur at 100- to 1,000-year intervals. Smaller earthquakes occur more frequently on all three faults (Hall, Goodhue, Haisley, and Barker 1986).

Ground Shaking

Ground shaking may result in transformation of the ground surface (lateral spreading and lurching) near the shoreline. Lateral spreading and lurching can influence structures in this area (Hall, Goodhue, Haisley, and Barker 1986a). Ground shaking would be amplified at the field station because of the low shear strength of unconsolidated soils (Rutherford & Chekene 1989).

Tsunamis

Tsunamis, also known as seismic sea waves, have been documented in San Francisco Bay. The probable maximum extent of a tsunami in the bay would be approximately 7.0 feet above mean sea level. A wave of this size could possibly reach the project site, which is at the 10-foot contour (above mean high tide). Tsunamis of this magnitude are expected to occur at 500-year intervals (Hall, Goodhue, Haisley, and Barker 1986).

Liquefaction

Ground shaking can result in a phenomenon called liquefaction. This occurs when sand, silt, or gravel becomes saturated with water and loses its strength. Alluvial deposits, such as those found on the project site, are susceptible to liquefaction. The project site is located between two areas of the field station that have the potential for liquefaction: the

fill areas along the shoreline and loose sand lenses in the northern part of the field station (Hall, Goodhue, Haisley, and Barker 1986, Rutherford & Chekene 1989).

ENVIRONMENTAL CONSEQUENCES

Soils

The high shrink-swell potential, low strength, and poor drainage of Clear Lake clay can influence construction of roads and structures. This impact is considered to be potentially significant. Proper construction techniques, such as the use of deep foundations, can minimize this impact.

Conclusion:

- Impact finding: The high shrink-swell potential of Clear Lake clay soils could affect construction.
- Significance: Potentially significant.
- Mitigation measures: 10.1 Use deep foundations to mitigate for expansive soils, if necessary.

Project construction could temporarily leave soils uncovered allowing soils to erode. This impact would be easily mitigated with proper construction techniques.

Conclusion:

- Impact finding: Soils left exposed during the construction period could be subject to erosion.
- Significance: Less than significant.
- Mitigation measures: 10.2 Secure soils exposed during the construction period.

Seismicity

Ground Shaking

Ground shaking could potentially affect the stability of structures near the bay shoreline. This could result in a potentially significant impact. Placement of buildings greater than 100 feet from the shoreline (as is the case with the proposed project) greatly reduces the potential for structural problems from lateral spreading and lurching.

Even though no serious emergencies have resulted from previous earthquakes at the field station, the potential for a sizable earthquake does increase the risk of structural damage to the facility. To reduce this risk, the project should be consistent with Title 24 of the California Administration Code, as required by law and the *University Policy on Seismic Safety*.

Conclusion:

- Impact finding: Ground shaking could potentially result in structural damage.
- Significance: Less than significant.
- Mitigation measures: 10.3 Comply with Title 24 of the California Administrative Code and the *University Policy on Seismic Safety*.

  10.4 Perform a site-specific geotechnical investigation of the project site.

Ground shaking could also result in the spilling or leakage of stored chemicals at the facility. The possibility of a chemical spill at the laboratory as a result of ground shaking is considered potentially significant because of the conceivable hazard to human health and the environment.

Conclusion:

- Impact finding: Ground shaking could potentially result in a chemical spill.
- Significance: Potentially significant.
- Mitigation measures: 10.5 Use interior design techniques to prevent objects from falling.

Tsunamis

An extremely large seismic wave could possibly reach the project site, although the possibility is remote because the maximum expected range of a tsunami in the bay is approximately 7.0 feet above mean sea level and the project site is at the 10-foot contour (above mean high tide). Given the infrequency of a tsunami of this magnitude, and the project site's height above mean sea level, this impact is considered less than significant.

Conclusion:

- Impact finding: An extremely large tsunami could affect the proposed project.

- o Significance: Less than significant.
- o Mitigation measures: None required.

Liquefaction

The project site could be subject to liquefaction in the event of an earthquake, although the probability is remote. The site is not within identified liquefaction zones, but properties to the north and south of the site are within liquefaction zones. This impact is considered less than significant since the project site is not within identified liquefaction zones; however, the developer should conduct a site-specific geotechnical investigation to determine with certainty the site's potential for liquefaction.

Conclusion:

- o Impact finding: The project site could be subject to liquefaction in the event of an earthquake.
- o Significance: Less than significant.
- o Mitigation measures: 10.4 Perform a site-specific geotechnical investigation of the project site.

MITIGATION MEASURES

10.1 Use Deep Foundations to Mitigate for Expansive Soils, if Necessary

Deep foundations should be used, if necessary, depending on the shrink-swell potential of the project site soils.

10.2 Secure Soils Exposed During the Construction Period

Bare soils should be secured during the construction process. Construction should be done during the dry season, if possible.

10.3 Comply with Title 24 of the California Administrative Code and the University Policy on Seismic Safety

Construction of the EPA laboratory should comply with the provisions of Title 24 of the *California Administrative Code,* using the most recent edition of the *California Uniform Building Code* for seismic standards. Title 24 gives specifications and design formulae to reduce seismic hazards in new buildings. Project implementation should also comply with the *University Policy on Seismic Safety* as administered by the Campus Seismic

Review Board. Design details should be consistent with recommendations by a California-registered engineering geologist to be retained by the developer (Campus Planning Office, University of California, Berkeley, and EIP Associates 1989).

10.4 Perform a Site-Specific Geotechnical Investigation of the Project Site

Onsite geotechnical investigations should be conducted under the direct supervision of a California-certified engineering geologist. The investigation should address anticipated ground acceleration at the building site and the potential for structure displacement caused by seismically induced vibration (Campus Planning Office, University of California, Berkeley, and EIP Associates 1989). Geotechnical investigations should be conducted at the project site prior to construction to identify potential liquefiable soils, such as bay mud, sand, silt, or clay.

The engineering geologist should present recommendations for the abatement of geotechnical hazards at the site, consistent with the provisions of the *University Policy on Seismic Safety* (Campus Planning Office, University of California, Berkeley, and EIP Associates 1989).

10.5 Use Interior Design Techniques to Reduce the Potential for a Chemical Spill

The proposed structures should be designed to accommodate ground shaking resulting from the maximum credible earthquake. Interior design features, such as fitting shelving with rims and anchoring shelves to the floor to prevent objects (and shelves) from falling, should be used.

CHAPTER 11. Cultural Resources

INTRODUCTION AND APPROACH

The Richmond Field Station was surveyed by Miley Holman and Glen Gmoser (both of Holman & Associates Archeological Consultants) for archeological artifacts in July 1989. Mr. Holman and Mr. Gmoser conducted a field reconnaissance by walking transects of all ground not covered by pavement at 20-foot intervals, thus affording visual inspection of all undeveloped ground surface. Mr. Holman also consulted the California Archaeological Inventory at Sonoma State University.

AFFECTED ENVIRONMENT

Results of the Record Search

According to Sonoma State University, no sites have been recorded at the field station, but several prehistoric sites were identified on Brooks Island (1.5 miles southwest of the project site) and to the west of the project site near the historic bay shoreline (prior to filling).

Brief Site History

Historically, the field station has been used for explosives and munitions manufacturing dating back to the mid-1800s. The Hercules Powder Company was one of several companies located at the field station until the 1920s, when California Cap Company purchased the explosives and munitions operations and became the sole manufacturer of explosives at the field station. California Cap Company manufactured explosives at the field station until the end of World War II, when they sold the property to the University of California. The university purchased the property in 1950 for engineering research projects (Ensco Environmental Services, Inc. 1989).

Results of the Archeological Field Reconnaissance

A search of archival material and a field reconnaissance revealed no evidence of historic or prehistoric use of the site. No artifacts were found within the project site; the archeologists did, however, identify a trench line at the field station that allowed visual

inspection of soil profiles for evidence of prehistoric or historic use. The field survey, including examination of the trench line, revealed no evidence of prehistoric or historic use in the area.

ENVIRONMENTAL CONSEQUENCES

Since the archival search and the field reconnaissance uncovered no evidence of historic or prehistoric use of the site, no impacts to cultural resources are anticipated. However, Mr. Holman stated in the Richmond Field Station Archeological Report that ". . . future construction activities at the site, if they involved deep trenching, could uncover archeological materials buried under the present soil layers."

Conclusion:

- o Impact finding: Implementation of the project is not expected to affect cultural resources since none has been identified at the field station; however, construction activities could disturb unknown cultural resources.
- o Significance: Less than significant.
- o Mitigation measure: Stop work if cultural resources are revealed during project construction.

MITIGATION MEASURES

11.1 Stop Work if Cultural Resources Are Revealed During Project Construction

Although no evidence of cultural resources was identified during the field survey, resources may potentially exist below the ground surface, particularly beneath placed fill material. If cultural resources are observed during future construction activities, work should be stopped at least 100 feet from the site until a qualified archeologist can inspect the resource and decide on further action, which may include testing, evaluation, and mitigation (Holman & Associates 1989).

CHAPTER 12. Alternatives Considered but Found to Be Infeasible

INTRODUCTION

The EPA has requested that alternative sites and the No-Project Alternative be evaluated as part of the environmental review process for the EPA laboratory. Two alternative sites at the Richmond Field Station have been evaluated: the Lark Drive Alternative and the North Starling Way Alternative. A third alternative, the No-Project Alternative, has also been addressed.

PROJECT ALTERNATIVES

Lark Drive Alternative

The Lark Drive Alternative was the university's original choice for the project site. This site was chosen for several reasons:

- its proximity to existing public utilities on Regatta Boulevard,
- its convenient access to Regatta Boulevard, and
- the university's desire to create a "gateway" on Regatta Boulevard for its proposed technical center to encourage additional development.

The Lark Drive site is adjacent to Regatta Boulevard at the proposed future intersection of Regatta Boulevard (previously known as South 32nd Street) and Lark Drive (Figure 12-1). Lark Drive deadends 120 feet east of Regatta Boulevard on the field station, but is proposed to be extended to Regatta Boulevard as a part of the field station's future research center master plan. As part of the master plan, 34th Street may also be extended south to Lark Drive.

The site encompasses 4.3 acres. It extends 471 feet in a north/south direction along Regatta Boulevard and 397 feet in an east/west direction along the proposed future extension of Lark Drive.

Existing land uses and habitat types include annual grassland, coastal prairie grassland, wetland vegetation, a warehouse, a concrete channel modeling the flow of the Kissimee River, and Starling Way. These uses would be converted to a laboratory, parking lot, and accessory buildings.

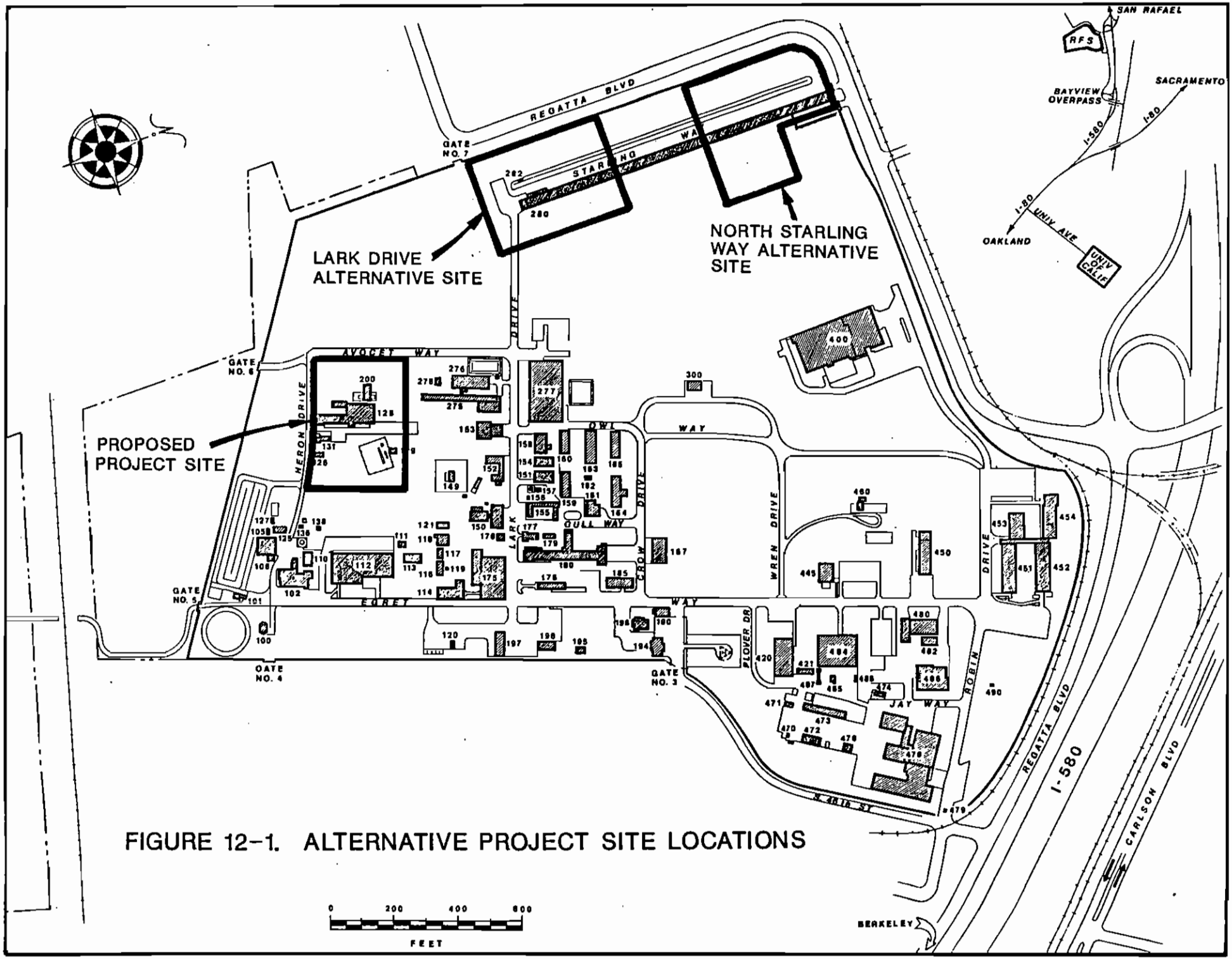


FIGURE 12-1. ALTERNATIVE PROJECT SITE LOCATIONS

Those persons traveling to the laboratory would have vehicle access via Regatta Boulevard near the Price Club at a location identified as "Gate 7" by the University of California. Lark Drive would be extended through the field station to Regatta Boulevard to serve the laboratory, but through traffic would not be permitted from Regatta Boulevard to the field station via Lark Drive (Hufferd pers. comm.). (The university plans to eventually open Lark Drive to serve as a public entrance to the research center once the master plan is implemented.)

The Lark Drive site contained potential COE jurisdictional wetlands that would be eliminated as part of the laboratory project. The EPA chose to withdraw this site from consideration based on the presence of these potential COE jurisdictional wetlands. Thus, further identification of impacts associated with this alternative is unnecessary.

North Starling Way Alternative

The 4.2-acre North Starling Way Alternative is located at the north end of Starling Way, approximately 800 feet north of the Lark Drive Alternative (Figure 12-1). The site is "L-shaped" to accommodate the planned expansion of the Northern Regional Library Facility. The north end of the site extends 400 feet in an east/west direction along Regatta Boulevard. The south portion of the site extends 600 feet along Regatta Boulevard.

This alternative is similar to the Lark Drive Alternative except for the proposed access. The North Starling Way Alternative would likely be reached by the southward extension of 34th Street from Regatta Boulevard. The extension of 34th Street to Lark Drive and the expansion of Lark Drive to Regatta Boulevard would not be implemented under this alternative. These changes in circulation patterns may be implemented in the future as part of the master plan the university is preparing.

This site was chosen as an alternative to the Lark Drive site to avoid coastal prairie grassland and minimize impacts to COE jurisdictional wetlands identified east of building 280. However, this alternative site was also withdrawn from consideration when it was determined that potential COE jurisdictional wetlands were present on the site. Thus, further identification of impacts associated with this alternative is unnecessary.

No-Project Alternative

Project Description

Under the No-Project Alternative, a new EPA laboratory would not be constructed at any location in the San Francisco Bay Area. The EPA would continue to use the Las Vegas, Nevada laboratory for their environmental programs. The field staging area currently located in Alameda would be moved to Treasure Island. This project is not consistent with the objectives of the proposed project of developing a regional laboratory in the bay area.

Land Use and Policy Issues

Under the No-Project Alternative, the site would remain as currently developed in the short term. Views of the site and from the site would not change. However, since the university intends to develop a research center at the field station, one could reasonably expect that the site would be developed with research and development land uses in the near future.

Public Utilities and Services

Implementation of the No-Project Alternative would result in no increase in demand for public services and facilities at the field station. Unlike the proposed project, this alternative would not require the relocation of existing gas lines, electrical lines, and the drainage system. This alternative would not subject the EPA laboratory to the possibility of flooding in the event a significant storm coincides with extreme high tides.

Hazardous Materials

Under the No-Project Alternative, no hazardous materials would be brought to the site.

Circulation

Circulation would remain in its existing condition under the No-Project Alternative.

Air Quality

Air Quality would not change under the No-Project Alternative.

Noise

Noise levels would remain as they currently exist under the No-Project Alternative.

Biotic Resources

The biotic resources of the project would not be disturbed under the No-Project Alternative.

Geology and Soils

Seismic hazards such as tsunamis and ground shaking would have no impact on the EPA laboratory under the No-Project Alternative.

Cultural Resources

Unknown cultural resources potentially on the site would remain undisturbed under the No-Project Alternative.

CHAPTER 13. Summary of Impacts and Mitigation Measures

INTRODUCTION

This chapter summarizes potentially significant impacts of the EPA laboratory project. The term "potentially significant" has been used in this report to demonstrate uncertainty. The designation is used in two circumstances: when it is unknown if an impact will occur, and when an impact can have a variable effect that is unknown. Both potentially significant impacts and significant impacts must be mitigated to a less-than-significant level. Impacts that cannot be mitigated to a less-than-significant level must be reclassified as "significant and unavoidable." No impacts of this project have been deemed significant and unavoidable.

This chapter also addresses cumulative impacts and irreversible resource commitments and provides a summary of recommended mitigation measures.

POTENTIALLY SIGNIFICANT IMPACTS REDUCIBLE TO A LESS-THAN-SIGNIFICANT LEVEL WITH SUGGESTED MITIGATION MEASURES

The following project impacts are considered potentially significant before mitigation but can be reduced to a less-than-significant level by incorporating the suggested mitigation measures into the project plans.

- Implementation of the project would increase runoff which could aggravate the potential for onsite flooding.
- Ground shaking could potentially result in a chemical spill.
- The high shrink-swell potential of Clear Lake clay soils could affect construction.
- Laboratory workers and visitors to the facility may be exposed to hazardous materials.
- Older structures on the project site may contain ACMs that could be released into the atmosphere during demolition activities.

CUMULATIVE IMPACTS

The project would contribute minimally to the following cumulative impacts:

- o sanitary sewer capacity problems during storm events,
- o capacity problems with the West Contra Costa Sanitary Landfill,
- o infrequent flood events along the Richmond shoreline,
- o significant traffic congestion experienced throughout the bay area,
- o existing air quality standards exceedances (ozone and carbon monoxide) stemming primarily from traffic problems, and
- o loss of grassland for raptor foraging.

These impacts are important, but the contribution of the EPA laboratory to these impacts would be minimal, given the small size of the EPA project. In addition, cumulative impacts would be small because the EPA laboratory would replace existing urban land uses that already contribute to these impacts. The EPA laboratory would, however, contribute slightly more to cumulative impacts than the existing urban land uses. In conclusion, the EPA laboratory is not expected to significantly increase cumulative impacts.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

A discussion of short-term use versus long-term productivity compares the value of implementing the proposed project to the value of retaining the site in its existing condition. Since this land is partially built on and the natural portions of the site have low habitat value, the value of short-term use by the EPA is expected to outweigh long-term productivity of the site in its existing condition.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Implementation of the project would irreversibly commit vacant land (less than 2.5 acres) to urban uses, including a laboratory, parking areas, and auxiliary structures. Given that this land is already partially built on, and the natural portions of the site have low habitat value, this impact is considered to be less than significant.

Implementation of the proposed project would also result in the permanent use of natural resources (i.e., petroleum products) during construction and operation of the facility. In addition, employees at the Las Vegas laboratory who currently use public transit may be

compelled to drive privately owned vehicles to work because the field station has limited access to public transportation.

GROWTH-INDUCING IMPACTS

The EPA laboratory project could potentially foster economic growth in the area because it could be identified as a secure anchor for future research and development land uses, in particular, those planned for the university research center. According to the development strategy for the research center, one factor in its success would depend on the type and quality of the first tenants to occupy the center. "The first user will be responsible for establishing the character/image of the research center in the eyes of both the university faculty and prospective non-university tenants" (Wallace, Roberts, and Todd 1989).

Other factors, however, contribute more strongly to economic growth in the area, including the recent expansion of I-580 and the current zoning designations (e.g., Special Industrial District). The EPA laboratory project is not expected to induce growth significantly under criteria typically used to assess growth inducement (i.e., the project would not extend urban services or transportation facilities, and the project is not expected to remove any major obstacles to development). Rather, implementation of the EPA laboratory is in response to active strategies by the city to increase growth in the south shoreline area. The EPA laboratory's role in inducing growth in the south shoreline area is expected to be minor.

SUMMARY LIST OF MITIGATION MEASURES

This section lists all the mitigation measures suggested in the report. The first list identifies those measures assigned to less-than-significant impacts which are recommended but not required. The second list identifies those measures assigned to potentially significant impacts. These measures are required.

Measures Recommended to Mitigate Less-Than-Significant Impacts

3.1 Assess Project Consistency with the Master Plan During Environmental Review of the Master Plan, and if Project Plans Have Not Been Finalized, Include Applicable Plan Policies and Design Standards into the Project

The environmental review of the field station master plan under CEQA (presumably preparation of an EIR) should address consistency of the proposed EPA laboratory with the master plan. If the project is found to be inconsistent with the master plan, include applicable master plan policies and design standards into the project, provided project plans have not been completed.

3.2 Ensure Compliance with Zoning Ordinance Design Guidelines Prior to Project Implementation

The EPA laboratory should comply with the landscaping, fencing, and sidewalk design guidelines provided in the zoning ordinance prior to project implementation. The zoning ordinance for the Special Industrial District is located in Appendix A of this report.

3.3 Ensure Compliance with Shoreline Conservation and Development Plan Landscaping Requirements.

The EPA laboratory should comply with the following SCDS landscaping requirements:

- Landscaping and open space should amount to 10-15 percent of the gross land area.
- Five percent of the landscaped area should be devoted to open space.

Given these recommendations, the project should include approximately 16,000-24,000 square feet of open space with approximately 8,100 square feet devoted to usable open space.

4.1 Evaluate Water Service Infrastructure and Project Demand to Determine if Waterline Renovation Is Necessary, and if so, Make the Necessary Improvements

The university, along with EBMUD, should evaluate the capacity of the existing waterlines and the water demand of the proposed project to determine the amount of upgrading needed. The 4-inch water line serving the project site would probably require upgrading to meet fire flow requirements and increased water demand stemming from this project, as well as the remainder of the proposed research center. If it is determined that upgrading of the waterline is necessary, the university should implement measures to improve the water delivery system.

4.2 Investigate the Need to Upgrade and Expand the Onsite Sanitary Sewer System and, if Needed, Implement Measures to Increase the Sanitary Sewer Trunk Line's Capacity

The available sewer line capacity during storm events should be compared to the amount of wastewater expected to be generated by the EPA laboratory to determine if the sewer line has adequate capacity to serve the project throughout the year. The university should work with the Richmond Municipal Sewer District to address this potential capacity problem. The university should implement measures as needed to increase the sanitary sewer trunk line's capacity. For example, a plastic slip line could be inserted into the sewer line to reduce groundwater infiltration. This measure is currently being implemented by ICI to decrease leakage of wastewater into the environment from their sewer line.

4.4 Reroute Surface Drainage From Properties Adjacent to the Project Site to Drainages Off the Project Site

Surface runoff carried by the swales and culverts crossing the project site should be redirected to other drainages, such as the culvert that parallels Avocet Way.

4.5 Implement a Drainage Plan for the EPA Laboratory

To manage runoff on the project site, the university should implement a drainage plan for the project site. The university appears to be planning the site drainage as evidenced by the depiction of catch basins and drainage inlets on the laboratory site plan. However, additional details of the site drainage plan are unavailable at this time.

4.6 Continue to Evaluate Potential Landfill Sites

Contra Costa County should continue to evaluate potential landfill sites.

4.7 Establish a Recycling Program at the EPA Laboratory and the Field Station

The EPA should implement a recycling program which would consist of non-contaminated glass and paper recycling. Collection could be provided by the Richmond Sanitary Service. The University of California should consider a recycling program for the entire field station, which would include the proposed research center. This mitigation measure would not reduce the impact to a less-than-significant level.

4.8 Implement the Mitigation Measures Suggested by the Richmond Fire Department and Required by the EPA

The potential for health and safety risks to humans from fire will be mitigated by the following design features, which have been requested by the EPA.

- Both buildings would be sprinklered. The sprinkler systems would be hydraulically designed to meet National Fire Protection Association Flammable and Combustible Liquid Code (NFPA) 13, local authority standards and recommendations. The system would be approved by a nationally recognized insurance company [EPA 1988, Section 7.19.7]. Fire protection for all laboratory rooms, computer rooms, and core telecommunications closets would be provided through a dual-sensing, preaction dry pipe sprinkler system which would be controlled by a deluge valve [U. S. Environmental Protection Agency 1988, Section 7.19.5].

- Smoke alarms would be installed in the buildings [U. S. Environmental Protection Agency 1988, Section 7.19.5].

- Manual fire alarms would be installed along the normal exit paths. The alarm signal would automatically be sent to the Richmond fire department in accordance with NFPA Standard 72B or 72C [U. S. Environmental Protection Agency 1988, Section 8.8].

- Fire doors that are normally held open by electromagnetic devices would be released automatically at the sound of the alarm [U. S. Environmental Protection Agency 1988, Section 8.8].

- Portable fire extinguishers would be located in areas of high fire hazard [U. S. Environmental Protection Agency 1988, Section 5.19.1].

- The buildings would be constructed of permanent, noncombustible construction [U. S. Environmental Protection Agency 1988 Section 5.1.4].

The risk of serious fire should be further reduced by the installation of a new water line with greater water pressure.

The building would be constructed with noncombustible material in accordance with the uniform fire code.

4.9 Prepare a Business Plan for the Laboratory

A business plan addressing the use of hazardous materials at the laboratory must be prepared and submitted to the Richmond Fire Department (and the Richmond Planning Department) before a determination of fire hazard impact can be accurately made. The planning department is expecting this information to be evaluated during the environmental review process under CEQA. The business plan, as identified in the Hazardous Materials Release Response Plans and Inventory Law of 1985, should include:

- design details of the facility (including floor plans, storage locations, and facility description);

- an inventory of hazardous materials handled or stored at the facility;

- an emergency response plan, including notification and evacuation procedures;

- a training program in safety procedures and emergency response for hazardous materials designed for new employees, including annual refresher courses; and

- precautions taken in the handling of compressed gases (Howard pers. comm. University of California, Berkeley, Campus Planning Office, and EIP Associates 1989).

4.10 Upgrade the Existing Waterline (as Needed) to Supply Adequate Water Pressure for Fire Fighting

An evaluation of the water requirements of the laboratory, the capacity of the water line, and firefighting water pressure needs should be conducted by the university, EBMUD, and the Richmond Fire Department. If upgrading is needed to comply with fire flow requirements the university would be responsible for the cost.

4.11 Install a Security System

The university should install a security system to guarantee the safety of all structures. The security system should be installed in all structures and, if deemed necessary by the EPA, the fenced parking area should also be protected with a security system.

4.12 Maintain Security Provided by the University

The university should continue to patrol the field station and should continue to maintain the university police station located in building 190.

4.13 Reroute and Underground Utilities that Cross the Site, as Proposed in the Project Description

The university intends to work with PG&E to reroute the existing overhead electrical line traversing the project. This line would be rerouted to the southwest side of the project site and undergrounded, as previously agreed to by the university and PG&E. Since the electrical lines at the field station are owned by the university, it would pay for the cost of rerouting and undergrounding.

4.14 Work with PG&E to Identify and Implement a Suitable Alignment for Rerouting the Gas Line Crossing the Site, if Necessary.

The university should work with PG&E to identify and implement a suitable course for rerouting the gas line crossing the site, if necessary. The gas line should be undergrounded with other utilities as proposed in the project description. Since the gas lines are owned by the university, it should pay for the cost of rerouting and undergrounding, if needed.

6.1 Provide a Total of 48 Parking Spaces to Accommodate Both Employees and Visitors

The number of parking spaces should be increased from 43 to 48 to accommodate both the EPA laboratory employees and visitors.

7.1 Reduce Dust at the Construction/Demolition Site with Water Trucks

Methods to reduce generation of dust (i.e., total suspended particulate matter) should be employed during construction and demolition activities, particularly those activities occurring near existing buildings.

7.3 Consult with the Bay Area Air Quality Management District Concerning the Potential Need for a Permit for Equipment That May Cause Air Pollution and for the Potential Release of Hazardous Materials into the Atmosphere

The EPA should consult with the BAAQMD regarding the possible need for a BAAQMD permit for the release of hazardous materials into the atmosphere.

8.1 Schedule Construction Activities for Hours When Fewer Employees are Expected to Be at the Field Station

Construction activities should occur mainly on weekends and during the early morning or late afternoon on weekdays.

10.2 Secure Soils Exposed During the Construction Period

Bare soils should be secured during the construction process. Construction should be done during the dry season, if possible.

10.3 Comply with Title 24 of the California Administrative Code and the University Policy on Seismic Safety

Construction of the EPA laboratory should comply with the provisions of Title 24 of the *California Administrative Code,* using the most recent edition of the *California Uniform Building Code* for seismic standards. Title 24 gives specifications and design formulae to reduce seismic hazards in new buildings. Project implementation should also comply with the *University Policy on Seismic Safety* as administered by the Campus Seismic Review Board. Design details should be consistent with recommendations by a California-registered engineering geologist to be retained by the developer (Campus Planning Office, University of California, Berkeley, and EIP Associates 1989).

10.4 Perform a Site-Specific Geotechnical Investigation of the Project Site

Onsite geotechnical investigations should be conducted under the direct supervision of a California-certified engineering geologist. The investigation should address anticipated ground acceleration at the building site and the potential for structure displacement caused by seismically induced vibration (Campus Planning Office, University of California, Berkeley, and EIP Associates 1989). Geotechnical investigations should be conducted at

the project site prior to construction to identify potential liquefiable soils, such as bay mud, sand, silt, or clay.

The engineering geologist should present recommendations for the abatement of geotechnical hazards at the site, consistent with the provisions of the *University Policy on Seismic Safety* (Campus Planning Office, University of California, Berkeley, and EIP Associates 1989).

11.1 Stop Work if Cultural Resources Are Revealed During Project Construction

Although no evidence of cultural resources was identified during the field survey, resources may potentially exist below the ground surface, particularly beneath placed fill material. If cultural resources are observed during future construction activities, work should be stopped at least 100 feet from the site until a qualified archeologist can inspect the resource and decide on further action, which may include testing, evaluation, and mitigation (Holman & Associates 1989).

Measures Recommended to Mitigate Potentially-Significant Impacts

4.3 Ensure the Project's Indoor Areas Are Above Potential Future Flood Levels, Determine the Risk of Site Flooding, and Reduce This Risk to an Acceptable Level, If Deemed Necessary

The EPA, the University of California, and the project developer should ensure that the indoor portions of the laboratory are elevated above potential flood levels resulting from heavy rains and extreme high tides. Structures should be designed to withstand the forecasted level and frequency of flooding. Chemical storage should be elevated above forecasted flood levels. In addition, the university should determine the available capacity of the field station's storm drainage system at the highest high tide. The university, in coordination with the Richmond Public Works Department, should determine how much additional capacity would be needed to prevent flooding of the laboratory project site during storm events. This information should be used to determine the risk of flooding on the project site. If the risk is considered high, the university should implement measures to reduce the potential for flooding to an acceptable risk level.

5.1 Continue to Implement Safety Precautions Taken at the Las Vegas Laboratory and Prepare a Hazardous Materials Business Plan

The EPA should continue to implement safety precautions taken at the Las Vegas laboratory regarding requirements for fire extinguishers, use of fume hoods, storage of hazardous substances and wastes, handling of chemical spills, and disposing of waste materials. The EPA should also prepare a hazardous materials business plan as previously suggested in this chapter in the section entitled "Hazardous Materials Management Planning." This plan would outline types and quantities of hazardous materials and wastes to be located at the laboratory, compliance with Richmond's hazardous waste regulations,

evacuation procedures, and an employee training program for handling hazardous materials.

5.2 Assess the Potential Presence of Mercury at the Former Mercury Fulminate Production Area and Eradicate it from the Site if Found to Be an Unacceptable Health Hazard

The mercury fulminate production area, located adjacent to the proposed EPA laboratory site, should be retested to determine the lateral and vertical extent of mercury contamination previously documented in the area. The university should perform the following testing, as recommended by Ensco Environmental Services, Inc.:

- Drill a maximum of 20 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 hole, and analyze each water sample for mercury (Ensco Environmental Services, Inc. 1989).

If mercury is found near the project site and is found to be an unacceptable health hazard, the university should coordinate removal efforts with the California Department of Health Services.

5.3 Assess the Potential Presence of Nitrates and Volatile Organic Compounds on the Project Site at the Former Shell Manufacturing Area; if these Materials are Identified on the Site, Assess the Health Risk and Eradicate, if Necessary

The university should perform the following tests, as recommended by Ensco Environmental Services, Inc.:

- Drill a maximum of 20 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 hole, and analyze each water sample for nitrates and volatile organic compounds (Ensco Environmental Services, Inc. 1989).

- 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 (Ensco Environmental Services, Inc. 1989).

If nitrate residues or volatile organic compounds are identified on the project site, the potential health risk should be assessed and the wastes removed, if necessary.

5.4 Identify and Dispose of Hazardous Materials Stored Onsite, if Any

As previously stated, approximately 10 unmarked 55-gallon drums are stored behind building 128. The contents of these drums are unknown. A small storage shed (building 131) also houses 55-gallon drums with unknown contents. The contents of these drums should be identified and the containers should be transported off the project site by a certified hazardous waste hauler for disposal or recycling if the contents are considered hazardous.

7.2 Remove All Asbestos-Containing Materials Prior to Demolition of Structures

The university should remove all asbestos-containing materials (if any exist onsite) prior to demolition of structures.

10.1 Use Deep Foundations to Mitigate for Expansive Soils, if Necessary

Deep foundations should be used, if necessary, depending on the shrink-swell potential of the project site soils.

10.5 Use Interior Design Techniques to Reduce the Potential for a Chemical Spill

The proposed structures should be designed to accommodate ground shaking resulting from the maximum credible earthquake. Interior design features, such as fitting shelving with rims and anchoring shelves to the floor to prevent objects (and shelves) from falling, should be used.

CHAPTER 14. Bibliography

REFERENCES CITED

Baseline Environmental Consulting. 1986. Draft environmental impact report, gas and chemical storage facility for storehouse. Oakland, CA. Prepared for: University of California, Berkeley, CA.

California Air Quality Data. 1989. Volume XVII-1985 to Volume XX-1988 annual summaries.

California. Department of Fish and Game. 1989. 1988 annual report on the status of California state-listed threatened and endangered plants and animals. Sacramento, CA.

California. Department of Health Services. 1989a. Berkeley laboratory consolidation and expansion project, draft environmental impact report. (SCH# 88053109.) Sacramento, CA.

_____. Department of Health Services. 1989b. Abandoned site program information system. Toxic Substances Control Division. Sacramento, CA. Unpublished data.

_____. Department of Health Services. 1989c. Expenditure plan for the Hazardous Substances Cleanup Bond Act of 1984. Toxic Substances Control Division. Sacramento, CA.

California. Office of Planning and Research. 1989. Hazardous waste and substances sites list. Office of Permit Assistance. Sacramento, CA.

Call, M. V. 1978. Nesting habitats and surveying techniques for common western raptors. U. S. Bureau of Land Management. Denver, CO.

CH2M Hill. 1988. Technical memorandum summarizing results of environmental sampling at the University of California Richmond Field Station. Emeryville, CA. Prepared for: University of California, Richmond Field Station, Engineering Department, Richmond, CA.

Contra Costa County. Community Development Department. 1989. Contra Costa County general plan. Martinez, CA.

_____. Community Development Department and EIP Associates. 1989. Draft environmental impact report for Contra Costa County solid waste management plan/county general plan amendment for COSWMP landfill sites. Martinez, CA.

Ensco Environmental Services, Inc. 1989. Environmental Assessment of University of California, Richmond Field Station, Richmond, CA. (Project No. 9313ACT.) Fremont, CA. Prepared for: Wallace, Roberts & Todd, San Francisco, CA.

Environmental Collaborative. 1989. Administrative draft report, biotic resource assessment. University of California, Berkeley, Richmond Field Station. Point Richmond, CA. Prepared for: Wallace, Roberts & Todd, San Francisco, CA.

Grandy, B. and F. Markowitz. 1989. Richmond Field Station, opportunities and constraints. Korve Engineering, Inc. Oakland, CA. Prepared for: Wallace, Roberts & Todd, San Francisco, CA.

Hall, Goodhue, Haisley, and Barker. 1986a. Shoreline conservation and development strategy: Technical Memorandum No. 2 - planning analysis. San Francisco, CA. Prepared for: Citizens Advisory Committee for the Shoreline Conservation and Development Strategy, Richmond, CA.

_____. 1986b. Shoreline conservation and development strategy, Richmond, CA. San Francisco, CA. Prepared for: Citizens Advisory Committee for the Shoreline Conservation and Development Strategy, Richmond, CA.

_____. 1989. Knox Freeway/Cutting Boulevard corridor specific plan. Draft. San Francisco, CA. Prepared for: The Citizens Advisory Committee for the Knox Freeway/Cutting Boulevard Corridor Specific Plan, Richmond, CA.

Holman & Associates. 1989. Archeological field inspection of the Richmond Field Station, Richmond, Contra Costa County, California. San Francisco, CA.

ICI Agricultural Products. 1989a. Responses to Richmond Annex questions on the proposed Western Research Center expansion project. May 16, 1989. Richmond, CA. Prepared for: City of Richmond Planning Department, Richmond, CA. Unpublished report.

_____. 1989b. Responses to Richmond Planning Departments comments/questions on the preliminary environmental analysis for the proposed Western Research Center expansion. May 12, 1989. Richmond, CA. Prepared for: City of Richmond Planning Department, Richmond, CA. Unpublished report.

Markowitz, F. 1989. Richmond Field Station: further comments on transportation opportunities/constraints memorandum. Korve Engineering, Inc. Oakland, CA. Prepared for: Wallace, Roberts & Todd, San Francisco, CA.

Natural Diversity Data Base. 1989. Computer data base search for Richmond 1:250,000 quad sheet. California Department of Fish and Game. Sacramento, CA.

The Planning Collaborative, Inc. 1988. Point Isabel to Miller-Knox regional shoreline corridor feasibility study. San Francisco, CA. Prepared for: City of Richmond, East Bay Regional Park District, Richmond, CA.

Remsen, J. V., Jr. 1978. Bird species of special concern in California. Department of Fish and Game. Sacramento, CA.

City of Richmond. Planning Department. 1987. Concise general plan document of the City of Richmond general plan. Richmond, CA.

_____. Richmond, Waterfront Development Committee. 1973. Richmond coastline plan. Richmond, CA.

Rutherford & Chekene. 1989. Richmond field station master plan: geotechnical information. San Francisco, CA. Prepared for: Wallace, Roberts & Todd, San Francisco, CA.

San Francisco Bay Conservation and Development Commission. 1988. San Francisco Bay plan. San Francisco, CA.

Smith, J. R. and K. Berg. 1988. Inventory of rare and endangered vascular plants of California. 4th edition. (Special Publication No. 1.) California Native Plant Society, Sacramento, CA.

South Richmond Shoreline Special Area Plan Citizens' Advisory Committee. 1977. South Richmond Shoreline special area plan. Richmond, CA.

Trumbull, T. 1989. Environment assessments: how can you avoid buying a pig in a hazardous poke? Western City. 5-7 pp. League of California Cities, Sacramento, CA.

University of California, Berkeley. 1990. Hazardous materials business plan. College of Engineering, Richmond Field Station Administration. Richmond, CA. Prepared for: Contra Costa County, Department of Environmental Health, Martinez, CA.

University of California, Berkeley and EIP Associates. 1989. Draft environmental impact report on the proposed Northwest Animal Facility project, University of California, Berkeley. (SCH# 89071809.) Campus Planning Office. Berkeley, CA.

U. S. Environmental Protection Agency. 1988a. Solicitation for offers. Facilities Management and Services Division, Region IX - Central Regional Laboratory. Washington, DC.

_____. 1988b. Region 9 quality assurance project plan. Region 9. San Francisco, CA.

U. S. Soil Conservation Service. 1977. Contra Costa County soil survey. Washington, DC.

Wallace, Roberts & Todd and KPMG Peat Marwick. 1989. University of California at Berkeley Research Center Draft feasibility study and preliminary master plan. San Francisco, CA. Prepared for: The Faculty-Administration Committee on Research Center Development, Berkeley, CA.

Williams, D. F. 1986. Mammalian species of special concern in California. California Department of Fish and Game. Sacramento, CA.

PERSONAL COMMUNICATIONS

Aramburu, Margit. Bay Design Analyst. Bay Conservation and Development Commission, San Francisco, CA. August 23, 1989 - telephone conversation.

Bell, Larry. Assistant Superintendent. University of California Richmond Field Station, Richmond, CA. August 15, 1989, January 18 and 19, 1990 - telephone conversations; January 16, 1990 - meeting.

Buck, Brenda. Project Manager. U. S. Environmental Protection Agency, Region 9, San Francisco, CA. August 10, 1989, and January 5 and 10, 1990 - telephone conversations.

Cranston, Lawrie. Major Account Representative. Pacific Gas and Electric Company, Richmond, CA. January 10, 1990 - telephone conversation.

Howard, David. Fire Marshall. Richmond Fire Department, Richmond, CA. August 22, 1989, January 6 and 10, 1990 - telephone conversations.

Hufferd, Kevin. Planner, Research Center Project Coordinator. University of California, Berkeley, CA. December 19, 1989 and January 19, 1990 - telephone conversations.

Husby, Peter. Environmental Scientist. U. S. Environmental Protection Agency, Region 9, San Francisco, CA. August 1 and 15, 1989 - telephone conversations.

Johnson, James. Chemist. U. S. Environmental Protection Agency, Region 9 laboratory, Las Vegas, NV. January 2 and 19, 1990 - telephone conversations.

Kaufman, Nancy. Principal Planner. City of Richmond Planning Department, Richmond, CA. August 18, 1989 - letter; January 16, 1990 - meeting.

Kuykendall, Glaud. Facilities Manager. University of California, Berkeley, Richmond Field Station, Richmond, CA. January 3, 6, 11, and 18, 1990 - telephone conversations; January 16, 1990 - meeting.

Linslay, Steve. Laboratory Supervisor. Richmond Municipal Sewer District, Richmond, California. August 21, 1989, January 2 and 11, 1990 - telephone conversations.

Loughman, Kay. Librarian. University of California, Northern Regional Library Facility, Richmond, CA. December 19, 1989 - telephone conversation.

McGowan, Bill. Associate Civil Engineer. East Bay Municipal Utility District, Oakland, CA. January 5 and 10, 1990 - telephone conversations.

Smiecinski, Ralph. Chemist. U. S. Environmental Protection Agency, Region 9 Laboratory, Las Vegas, NV. August 10, 1989 - telephone conversation.

Tuohy, Sharon. Assistant to the Director of Engineering. Richmond Sanitary Services, Richmond, CA. January 3, 1990 - telephone conversation.

Valone, Ray. Planner. Contra Costa Community Development Department, Martinez, CA. January 6, 1990 - telephone conversation.

CHAPTER 15. Report Preparers

This draft EA has been prepared for the EPA by Jones & Stokes Associates. The persons involved in its preparation are identified below.

Ron Bass	Principal-in-Charge
Alan Solbert	Project Manager
Neila Imlay	Project Coordinator: Introduction, Project Description, Land Use, Public Utilities, Hazardous Materials, Circulation, Air Quality, Noise, Biotic Resources, Geology and Soils, Cultural Resources, and Alternatives
Paul Cylinder	Botanical Resources
Edward Whisler	Wildlife
Juliet Arroyo	Public Services and Utilities
Mike Zanoli	Hazardous Substances
Randy Stegen	Air Quality and Noise
Wayne Shijo	Traffic and Circulation
Tony Rypich	Graphics
Ruthie McRonald	Production Supervisor
Robin Haney	Lead Operator
Jennifer Johnson	Word Processor
Monica Parkhurst	Editor
Jack Whelehan	Editor
Beverly Johnson	Report Reproduction

APPENDIX A. Zoning Ordinance of the City of Richmond Special Industrial District

ZONING ORDINANCE OF THE CITY OF RICHMOND
CHAPTER 15.04 OF THE MUNICIPAL CODE, AS AMENDED
EFFECTIVE DATE: JANUARY 31, 1949

* Page numbers are listed sequentially for each section; they are not a part of the Ordinance.

A. TITLE AND PURPOSE.

This Section shall be known as the Special Industrial District. This district is established in order to provide land use and development controls for the area beyond those contained in the existing M-1, M-2 and M-3 regulations. The primary objectives of these zoning regulations shall be as follows:

1. Implementation of the Special Industry Land Use Category of the Richmond General Plan;

2. Promotion and accommodation of a wide range of appropriate land uses as suggested by the Shoreline Conservation and Development Strategy. This objective shall include policies to allow for the continued operation of existing viable land uses in the district with minimum disruption;

3. Provision for a review process which affords the City the opportunity to review development proposals that have a potential for significant impacts without imposing unnecessarily time consuming or bureaucratic procedures on the landowners and users.

4. Protection of the public welfare through the regulation of activities involving nuisance characteristics and/or the use of hazardous materials.

5. Protection of visual quality of the district especially as perceived from major collector streets, non-motorized circulation corridors, public open spaces, adjacent residential uses, and the shoreline.

6. Provision of clear and definitive development standards and standards of operation.

B. DEFINITIONS.

1. Bulk Plant. Refer to Section 15.04.145 D.

2. Bulk Storage and/or Distribution. Refer to Section 15.04.145 D.

3. Commercial Packaged. Refer to Section 15.04.145 D.

4. Hazardous Materials. Refer to Section 15.04.145 D.

5. Household Packaged. Refer to Section 15.04.145 D.

6. Lab Amounts. Refer to Section 15.04.145 D.

7. Minor Streets. For purposes of this Section, Minor Streets shall include all streets except those designated as Collector Streets.

8. Collector Streets. For purposes of this Section, Collector Streets shall be determined per the standards of the Public Works Department or as designated by the City Council.

(The following streets or portions of streets as shown on the Zoning Map have been designated as Collector Streets for purposes of the M-S District: Marina Bay Parkway, South 27th Street, Regatta Boulevard, South 34th Street, Meeker Avenue, South 37th Street, Meade Street, South 51st Street, Rydin Road, and Central Avenue. Ord. 46-88 N.S. 12/12/88. The preceding material has been provided for informational purposes only and is not part of the M-S District text.)

C. USE.

Under the provisions set forth in this Section and Section 15.04.193, the following uses may be permitted within the Heavy Industrial (HI) or Light Industrial/Research and Development (LI/R&D) areas of the district by right or with special review (conditional use permit approval) by the City, dependent upon use and quantities of hazardous substances (refer to Section 15.04.145 D.) Following each entry on the list will be a coded designation indicating how and where those uses are permitted; where applicable, exceptions are noted under each listing. The code is as follows: P = permitted, N = not permitted, CUP = permitted subject to approval of a conditional use permit.

**	Use	HI	LI/R & D
1.	Food and Kindred Products Manufacturing EXCEPTION: Slaughtering, rendering, glue and size processing not permitted in HI or LI/R&D.	P	CUP
2.	Textile Mill Products Manufacturing	P	CUP
3.	Apparel and other Finished Products from Fabric, Leather and Similar Materials Manufacturing EXCEPTION: Small scale custom mfg. of fabric products permitted in LI areas.	P	CUP
4.	Lumber and Wood Products Manufacturing EXCEPTION: Not including furniture manufacturing & repair (See Item 5).	CUP	N
5.	Furniture and Fixture Manufacturing EXCEPTION: Small scale custom mfg. permitted in LI/R&D.	P	CUP
6.	Paper and Allied Products Manufacturing	CUP	N
7.	Printing, Publishing, and Allied Industries	P	P

** Uses involving chemicals may also be subject to Section 15.04.145 D., Hazardous Materials; in which case, the more restrictive requirements shall apply.

8.	Petroleum Related Industries Manufacturing	CUP	N
9.	Rubber Products Manufacturing	CUP	N
10.	Chemicals and Allied Products Manufacturing Including medicinal/pharmaceuticals. EXCEPTION: Uses involving hazardous materials are subject to the permitting requirements of Table 1 in Section 15.04.145 D, Hazardous Materials.	P	CUP

**	Use	HI	LI/R & D
11.	Research and Development Activities EXCEPTION: Conditional Use Permit shall be required in HI and LI/R&D for activities involving or relating to the following: a. The use of viruses or infectious materials. b. The manipulation of genetic material of living organisms including, but not limited to, recombinant DNA molecules and organisms (as defined in the National Institute of Health Guidelines); cell fusion; and novel bioprocessing techniques. c. Uses classified by the National Institute of Health as large-scale (greater than 10 liters of culture) research or production. d. Uses where the laboratory requirements are at a Biosafety Level Two or above as defined by the National Institute of Health and the Center for Disease Control. (Approval criteria and use of professional assistance, for this type of CUP, would be per Section 15.04.145 D.5.c.).	P	P
12.	Stone, Clay, and Glass Product Manufacturing EXCEPTIONS: Cement, lime, and plaster manufacturing and stone milling shall require a Conditional Use Permit in HI and LI/R&D; Small scale custom mfg. permitted in LI/R&D.	P	CUP
13.	Primary Metal Industries EXCEPTIONS: Ore reduction, refining, smelting, and extruding not permitted in HI or LI/R&D; plating, casting and foundry activities require a Conditional Use Permit in HI; fabricating, alloying, and finishing permitted in HI.	P	N
14.	Fabricated Metal Products Manufacturing EXCEPTIONS: Motor vehicle, heavy equipment, structural steel, iron and pipe manufacturing and shipbuilding shall require a Conditional Use Permit in HI and LI/R&D; Small scale custom mfg. permitted in LI.	P	CUP

** Uses involving chemicals may also be subject to Section 15.04.145 D., Hazardous Materials; in which case, the more restrictive requirements shall apply.

**	Use	HI	LI/R & D
15.	Electrical and Electronic Equipment Mfg. See "Professional ...Equipment" etc. below; EXCEPTIONS: Assembly of electronic components with no mfg. permitted in L.I.; Uses involving hazardous materials are subject to the permitting requirements of Table 1 in Section 15.04.145 D., Hazardous Materials.	P	CUP
16.	Professional, Scientific, and Precision Equipment Manufacturing	P	P
17.	Warehousing, Distribution, and Storage Activities Including self-service storage facilities (mini-warehouses).	P	CUP
18.	Welding, Painting, Enameling and Lacquering Activities Including machine shops.	P	N
19.	Recycling Activities Including collecting, sorting, storage, or bailing of rags, paper, iron, cast-off or salvage material, subject to approval of a Conditional Use Permit and to the limitations listed for Light Processing Facilities in Section 15.04.140. EXCEPTION: Reverse vending machines, mobile recycling units, and collection facilities shall be permitted per the limitations specified in Section 15.04.100.	CUP	CUP
20.	Contractor Yards, Transit System Yards, Motor Vehicle Storage, and Motor Vehicle or Equipment Service Yards	CUP	N
21.	Motion Picture, Video, Audio Recording Studios and Production Facilities	P	CUP
22.	Industrial Product Sales	P	P
23.	Utility Substations and Public Service Structures and uses	P	P

24. Other uses as determined by the Planning Director to be essentially the same as or very similar to those listed above, shall be permitted as are those uses to which they are determined to be most similar.

** Uses involving chemicals may also be subject to Section 15.04.145 D., Hazardous Materials; in which case, the more restrictive requirements shall apply.

25. ON-SITE ACCESSORY USES.

a. Those uses that are clearly incidental and accessory to those uses listed above, may be allowed if they are sited within the property boundaries of the primary use. Including but not limited to the following:

1. Administrative offices.
2. Food service facilities.
3. Recreation amenities including private landscaped open space.
4. Parking lots.
5. Outdoor storage and activity areas meeting the required conditions of the district.

b. The following accessory uses may be permitted if approved by the Commission according to the procedure set forth in Section 15.04.190.

1. Motor vehicle, rail or water terminal for freight or passengers.
2. Radio, telephone, or television transmitters and dish-type receivers requiring licensing by the Federal Communications Commission.
3. Schools or instructional facilities, including day care facilities.
4. Any accessory uses determined by the Planning Director to exhibit nuisance characteristics including but not limited to the emission of noise, smoke, vapor, odor, dust, light, glare, or excessive vibration (refer to Standards of Operation, Section 15.04.145 C.).

26. SUPPORT USES AS PRIMARY USES.

The following uses may be permitted if approved by the Commission according to the procedure set forth in Section 15.04.190.

a. Administrative services including information processing and management and records storage.
b. Commercial facilities (e.g. retail, general offices, lodging).
c. Industrial services.
d. Institutional, educational and recreational facilities.
e. Parking lots.

D. USE OF HAZARDOUS MATERIALS.

1. Standards: The permitted on-site quantities and uses of hazardous materials for an activity are listed in Table 1.

2. Definition of Hazardous Materials and Hazardous Materials Quantities.

a. Hazardous Materials. Hazardous materials classifications and definitions are from Appendix VI-A of the Uniform Fire Code, 1988 edition. This reference to the 1988 Uniform Fire Code is for the purposes of definition only. These terms are also further defined in Titles 29 and 49, Code of Federal Regulations (Fed-OSHA; Transportation). Hazardous Materials belonging to more than one category are subject to the regulations of the more stringent category.

b. Bulk Plant. Hazardous materials at the bulk plant level are primarily manufactured, synthesized, processed, blended, or packaged. Materials are stored in large fixed containers. Bulk plant quantities are larger than the amount transported in or out in any single shipment.

c. Bulk Storage and/or Distribution. Hazardous materials at the bulk storage or distribution level are primarily collected, repackaged, blended or stored on-site; may be used or sold on-site. The materials are generally transported to the site in an unpackaged form and are then transferred to the activity's storage container by hose, pipeline, conveyor belt, etc. On-site usage of rail car, tanker truck, or similar vehicle for storage is considered at this quantity level.

d. Commercial Packaged. Hazardous materials at the commercial package level are stored in discrete containers which are handled individually, palletized or unitized for purposes of transportation. Packaged materials are used or sold on site. Packages may include cylinders, drums, boxes, glass jars,etc.

e. Lab Amounts. Hazardous materials at the lab amount level are primarily those amounts which are less than Commercial Packaged amounts, are generally recognized by the industry as that which is required for normal laboratory research and development activities, and which, if an incident were to occur, would not have impacts beyond the immediate premises.

f. Household Packaged. Hazardous materials at the household packaged level are packaged and distributed in a form intended or suitable for sale through retail sales outlets for consumption by individuals for purposes of personal care or household use.

3. Permitted. Conditionally Permitted and Not Permitted Uses of Hazardous Materials.

TABLE 1	HI Bulk Mfg Plant	HI Bulk Stor &Dist	HI Comm Pkg Amts	HI Lab Amts	LI/R&D Bulk Mfg Plant	LI/R&D Bulk Stor &Dist	LI/R&D Comm Pkg Amts	LI/R&D Lab Amt
EXPLOSIVES AND BLASTING AGENTS High explosives Peroxides capable of detonation Low explosives Blasting Agents	NO	CUP	CUP	P	NO	NO	NO	P
TOXIC MATERIALS Class A & B poisons	CUP	CUP	CUP	P	NO	CUP	CUP	P
HIGHLY UNSTABLE MATERIALS Organic peroxides Class I-II Oxidizers Class 4 Phyrophoric materials Unstable materials Class 4-3 Water-reactive materials Class 3	CUP	CUP	CUP	P	NO	CUP	CUP	P
RADIOACTIVE MATERIALS In amounts licensed by State	NO	CUP	P	P	NO	NO	CUP	P
MODERATELY HAZARDOUS MATERIALS Corrosives Flammable gases Flammable liquids Flammable solids Organic peroxides Class III Oxidizers Class 3-2 Water-reactive materials Class 2	CUP	CUP(a)	P	P	CUP	CUP(a)	P	P
MATERIALS WITH LIMITED HAZARDS Combustible liquids Irritants Oxidizers Class 1 Organic peroxides Class IV-V Sensitizers Unstable materials Class 2-1 Water-reactive materials Class 1	P(b)	P	P	P	CUP(a)	P	P	P

Permissibility: P = Permitted, CUP = CUP required, NO = Not permitted

Notes:
(a) If stored underground, then permitted outright.
(b) If one-half mile or closer to a residentially zoned or developed parcel, school, college or hospital, then a CUP is required.
(c) If conflicts arise between Table 1 and Section 15.04.145 C.1 through 26, the more restrictive regulations shall apply.

See next page for qualifiers and exceptions.

4. Qualifiers and Exceptions

a. In addition to these regulations, all storage or use of hazardous substances must be approved by the Fire Chief and be in conformance with all applicable fire and building codes.

b. Unless otherwise stated in Table 1, packaged quantities of hazardous substances for on-site use or sale are permitted in the zones.

c. Household Packaged hazardous substances are exempt from these provisions; however, the provisions of Section 15.04.193 may apply.

d. An existing use would be subject to Table 1 requirements if the quantity of material used increases to a higher quantity level or the category of chemicals used changes to a higher (more hazardous) category (e.g. a change from a Moderately Hazardous Material to a Toxic Material).

5. Conditional Use Permit Review for Hazardous Substances Use. Required CUP for hazardous substance use shall be processed as follows:

a. Procedures: Same as outlined in Section 15.04.190 of the Richmond Municipal Code.

b. Evaluation Factors: Factors to be evaluated in reviewing requests shall include, but are not limited to:

1. The amount of, and level of hazard presented by the substance;
2. Safety measures being proposed;
3. The potential for odors and toxic fumes;
4. The number of people and amount of land and structures which would be at risk if there were a major accident;
5. Location of the site in relation to identified areas of special environmental concern such as water courses, water wells, underground aquifers, or fish and wildlife habitats;
6. Location of the site in relation to designated routes for the transport of hazardous substances; and
7. Any other public welfare concerns identified by the staff.

c. Approval Criteria: The request may be approved if it is found:

1. The activity will not create an unreasonable risk to the public health and safety or to the surrounding properties and activities; and

2. The activity is consistent with the character and economic function of the surrounding area; and

3. The proposed activity will not result in a significant impact on environmentally sensitive areas; and

4. The request has been approved by the Fire Department.

Professional Assistance For City Determinations: Whenever the approval or satisfaction of the Planning Commission may be required in this Section, the Planning Director may, at such applicant's sole cost and expense, retain a suitably qualified independent engineer, or chemist, or other appropriate professional consultant regarding the adequacy of the application to achieve the purposes of this Section. The consultant's proposal shall not exceed 40 hours and/or a fee of $4,500, which amount may be changed pursuant to Council resolution to reflect future inflation. The Planning Commission shall be entitled to rely on such evaluation and/or opinion of such engineer, chemist or professional consultant in making the relevant determinations provided for this Section. Processing of such an application and selection of a consultant shall follow the procedures specified in Section 15.04.193 F.5.

E. STANDARDS OF OPERATION.

1. Regulatory Agencies. All uses shall comply with the regulations of the Bay Area Air Quality Management District, the Regional Water Quality Control Board, the San Francisco Bay Conservation and Development Commission, the State and County health departments, and any other regulatory agencies which exist or may be established to ensure environmental quality in the San Francisco Bay Region. Any conflicts between the regulations established by this Section and those of another agency shall be resolved to the mutual satisfaction of the agencies.

2. Emissions. No use shall be permitted which creates emissions that endanger human health, can cause damage to animals, vegetation or other property or which can cause soiling at any point beyond the boundaries of the site.

3. Odors. No continuous, frequent or repetitive odors are permitted which are perceptible on or beyond adjacent property lines. An odor detected no more than 15 minutes in any one day shall not be deemed to be continuous, frequent or repetitive for this regulation.

4. Noise. The City's noise regulations are stated in Section 9.22.040 of the Richmond Municipal Code. In addition, no continuous, frequent or repetitive noises are permitted which are detectable on or beyond adjacent property lines and which exceed 65 dBA. A noise of no more than five minutes in any one day shall not be deemed continuous, frequent or repetitive for this regulation. Areas of significant potential noise generation, e.g. loading docks, truck

parking areas, garbage and trash collection and exterior activity areas, etc., shall be so designed that adjacent properties, especially those of a residential character, will not be adversely affected by sound.

5. Vibrations. No continuous, frequent or repetitive vibrations shall be produced which are discernable on or beyond adjacent property lines to a person of normal sensitivities and which exceed 0.002g peak. Vibrations from temporary construction and vehicles which leave the site (such as trucks, trains, airplanes and helicopters) are excluded. Vibrations of no more than five minutes in any one day shall not be deemed continuous, frequent or repetitive.

6. Glare. Lights, reflective surfaces or any other sources of illumination including high temperature processing, such as welding or metallurgical refining, shall be located or shielded so as to prevent any glare or direct illumination on any public street or other property.

7. Design Standards. All projects shall be subject to site and development review per Section 15.04.205 of the Richmond Zoning Ordinance. Particular emphasis shall be placed on the design of building elevations and walls, both structural and screening, facing street frontages. Further, all mechanical equipment, switching boxes, transformers, etc. shall be screened from off-site view and all other utilities undergrounded.

8. Sidewalks and Street Trees. Sidewalks, curbs and gutters shall be provided on all public streets. Street trees shall be provided in accordance with the regulations of the Public Works Department.

9. Fences. The location of all fences shall be subject to the minimum setback standards contained herein.

10. Maintenance. Each person, company or corporation utilizing a lot shall at all times maintain such lot in good order. This shall include repair and maintenance of all structures, fences, signs, walks, driveways, lawns, landscaping, painting, etc. as may be necessary to preserve a high quality as established by the M-S District .

F. AUTOMOBILE PARKING AND LOADING AREAS.

1. Parking Space Requirements.

Industrial Product Sales; Industrial Service: Manufacturing & Production; Vehicle Service	1 space/750 sq. ft. of gross floor area.
Warehouse and Distribution	1 space/750 sq. ft. of gross floor area. for the first 5,000 sq. ft. and 1 space per 2,000 sq. ft. for all additional square footage.

Office Activities; Personal Services; Retail Product Sales & Service; Research and Laboratory Activities	1 space/350 sq. ft. of gross floor area plus 1 space per 2.000 sq. ft. of exterior display or exterior storage area.

General Notes: If lot size is 5,000 sq. ft. or less, then no more than 6 spaces are required, and if lot size is from 5,001 to 10,000 sq. ft., then no more than 10 spaces are required. If the facility falls within more than one category, then the standards are applied proportionately to the use allocation of the facility.

Gross floor area shall be used in computing required parking spaces and all fractions shall be rounded up to the next whole number. In addition, to the above required parking, adequate off-street parking shall be provided for all vehicles, including but not limited to fleet vehicles, used either in conjunction with the activity or serviced by the activity. Parking space reductions may be permitted if a rideshare, transit incentive program, or other transportation system management program is provided and approved by the Planning Commission.

2. Parking Lot Placement and Development Standards

   a. Parking space dimensions shall be per the standards established by the Department of Public Works.

   b. Surface parking lots shall be paved and set back as follows:

	Setbacks	
	HI	LI/R&D
Minor Streets	5'	15'
Collector Streets	25'	25'

   c. Parking lots containing 12 or more auto spaces shall contain a minimum of one tree per four parking spaces.

   d. Setback areas for parking lots shall include, low hedges, shrub masses, berms, screen walls or fences of an appropriate height, or other devices to provide visual screening.

   e. Truck parking. Truck parking lots in the HI and LI/R&D areas shall meet the setback, landscaping, and screening requirements for exterior storage in HI (see Section 15.04.145 H.)

3. Parking Lots Not Meeting the Landscape Requirements Specified in Sections 15.04.145 F.2.c. & d.

   a. Deficient border landscaping. Parking lot expansions over 20 percent of the existing parking area shall require all landscaping and screening requirements for the entire parking lot

to be met. If there is less than two feet available for border landscaping around the existing parking area, only an S1 screen, as defined in Section 15.04.145 I., is required around that portion of the lot.

b. Deficient interior landscaping. Interior landscaping shall be provided for the entire parking lot if: a) a lot is expanded more than 20 percent or improved from unpaved to paved, and b) there is no interior landscaping, or if what is existing does not meet the landscaping requirements specified in Sections 15.04.145 F.2.c. and d.

4. Loading Areas

a. All structures containing 5,000 sq. ft. or more of gross floor area shall provide at least one loading area on the site. Loading spaces shall be at least ten (10) feet wide, sixty (60) feet long, and fifteen (15) feet high, exclusive of drives or aisles.

b. Loading areas for activities in the Sales and Service categories must have a minimum length of 35 feet, not the 60 feet normally required.

c. Loading areas shall be designed so that vehicles enter and exit the site in a forward motion.

d. Loading areas in the HI and LI/R&D areas shall meet the setback, landscaping, and screening requirements for exterior storage in HI (See Section 15.04.145 H.).

G. HEIGHT.

1. Maximum building height shall be 50' within the HI and LI/R&D areas except as noted below in paragraphs #2 and #3.

2. All buildings within 250 feet of the shoreline or within 100 feet of paths, parks, dedicated open space, collector streets or residential development shall not exceed 35 feet in height.

3. The Planning Commission may approve a Conditional Use Permit per the procedures set forth in Section 15.04.190 of the RMC for buildings in excess of the height limits noted above in paragraphs #1 and #2 (not to exceed 75' in height).

H. AREA.

1. MINIMUM SETBACKS FOR BUILDINGS (Letters and numbers in parenthesis indicate minimum landscaping and screening requirements as defined in Section 15.04.145 I.)

	HI	LI/R&D
Minor Streets	10 '(L1)	15'(L1)
Collector Streets	25' (L1)	25'(L1)
Side property lines, except where they abut a street than street setbacks apply	10'	10'
Rear property lines, except where they abut a street than street setbacks apply	0'	0'
Abutting residential parcels and recreational amenities	15'(S3)	15'(S3)

2. MINIMUM SETBACKS AND LANDSCAPING REQUIREMENTS FOR EXTERIOR DEVELOPMENT:

Exterior development is permitted only in the HI Areas with the following minimum setbacks and landscaping requirements (see Section 15.04.145 I for definitions of landscaping requirements).

a. Exterior Activities: outdoor processing, assembly, or fabrication of goods; maintenance, repair and salvage of equipment.

Minor Streets	10'(L1/S2)
Collector Streets	25'(S2/L1 & L2)
Side and rear property lines, except where they abut a street than street setbacks apply	0'(S2)
Abutting residential parcels and recreational amenities	0'(S3)

b. Exterior Storage: includes outdoor storage of raw or finished goods including gases, oil, chemicals, gravel, etc,; building materials, packing materials, salvage goods, machinery, equipment, damaged vehicles, etc.

Minor Streets	10'(L1/S2)
Collector Streets	25'(S2/L1 & L2)

2. b. Exterior storage (continued)

Side and rear property lines 0'(S2)
except where they abut a street
than street setbacks apply

Abutting residential parcels 0'(S3)
and recreational amenities

3. PAVING

a. HI zones: Exterior development subject to vehicular traffic and accessible by driveway and/or curb cuts shall be paved per the requirements of the Department of Public Works.

b. LI/R&D zones: All exterior development, exclusive of landscaped areas, shall be paved.

4. EXTERIOR DEVELOPMENTS NOT MEETING THE STANDARDS SPECIFIED ABOVE IN SECTION 15.04.145 H.2.

a. Exterior developments may not be expanded into required setback areas.

b. Expanded exterior development areas must comply with the regulations of this section.

c. Exterior development expansions over 1,000 square feet shall require compliance with all street side landscaping and screening regulations for the entire development. If there is less than two feet available for street side landscaping and screening, only an S2 screening is required.

d. Exterior development areas in zones where not permitted may continue, but may not be expanded. In addition, they must be landscaped and screened if the primary use is modified by:

1. Expansions of floor area over 20 percent; or
2. There are additions, alterations or repairs exceeding 50 percent of the value of the existing building or improvement; or
3. There is change of use to another activity category.

The landscaping and screening shall meet the standard for exterior storage in that zone.

I. LANDSCAPING AND SCREENING.

1. Minimum materials for required landscaping:

a. Open areas: Required open areas shall be landscaped, seeded or left in natural condition, and may include trails, pathways, recreational areas or furniture for pedestrians. Open areas may not be paved, graveled, filled, excavated, covered by structures, or used as storage areas.

b. L1: Green growing ground cover. May include grass, shrubs, perennial flowers, and vines. Plantings should be made in such number or size to cover 100 percent of the landscaped area within two growing seasons. Where required ground cover areas are 15 feet or wider, a line of trees shall also be provided at the rate of one tree for every 30 lineal feet, or fraction thereof. Where required ground cover areas are less than 15 feet wide, trees may be required.

c. L2: Low hedge. May include hedge plants and shrubs. Plants should be of such type and number to reach a height of three feet within three years and to be of such density as to be at least 75 percent opaque year round.

d. L3: High hedge. May include trees, hedge plants and large shrubs. Plants should be of such type and number to reach a height of six feet within three years and to be of such density to be at least 75 percent opaque year round.

e. S1: Low solid screen. A fence or wall three to four feet high and fully sight obscuring. May be painted, view obscuring wood board fence or masonry wall of uniform material that is designed and constructed to withstand a 15 pound-per-square foot wind load and deterioration resulting from contact with soil, vermin and weathering. Wire fences with dark colored, durable, matt finishes (both wire and posts) and vinyl slats are permitted if also planted with fast growing trees, hedge plants, upright shrubs or evergreen vines and used in combination with L1 or L2 landscaping.

f. S2: High solid screen. A screen six to eight feet high and sight obscuring. May be painted, view obscuring wood board fence or masonry wall of uniform material that is designed and constructed to withstand a 15 pound-per-square foot wind load and deterioration resulting from contact with soil, vermin and weathering. Wire fences with dark colored, durable, matt finishes (both wire and posts) and vinyl slats are permitted if also planted with fast growing trees, hedge plants, upright shrubs or evergreen vines and used in combination with L1 or L2 landscaping. May also be a masonry wall with lattice work resulting from an open brick pattern or use of open masonry blocks.

g. S3: Solid wall. A wall six to eight feet high and fully sight obscuring. The wall may be masonry, brick, concrete or exposed aggregate and is designed and constructed to withstand a 15 pound-per-square foot wind load and deterioration resulting from contact with soil, vermin and weathering.

h. Street trees. Street trees shall meet the requirements of the Parks and Landscaping Division of the Public Works Department.

i. Other required trees. Deciduous trees at the time of planting shall be fully branched, have a minimum caliper of 1-1/2 inches, and a minimum height of eight feet. Evergreen trees at the time of planting shall be fully branched and a minimum of six feet in height.

2. Landscape Plans:

Landscape plans, including irrigation plans, must be submitted for the required landscaped or screened areas, and shall be subject to the City's Landscape Design and Development Guidelines. They shall be drawn to scale. Planting schedules shall indicate and show species by common and botanical names, size and placement of plants. Materials, size and placement of screens shall be shown.

3. Maintenance:

Required landscaping shall be continuously maintained in a healthy and attractive manner. An automatic irrigation system is required to establish and maintain plants. Vegetation shall be pruned back from pedestrian areas and vehicle travel areas.

APPENDIX B. Common and Scientific Names of Wildlife Species Potentially Occurring on the EPA Laboratory Site or Mentioned in the Text

Appendix B. Common and Scientific Names of Wildlife Species Potentially Occurring on the EPA Laboratory Site or Mentioned in the Text

Common Name	Scientific Name
Reptiles	
Gopher snake	*Pituophis melanoleucus*
Common garter snake	*Thamnophis sirtalis*
Birds	
Great blue heron	*Ardea herodias*
Mallard	*Anas platyrhynchos*
Black-shouldered kite	*Elanus caeruleus*
Northern harrier	*Circus cyaneus*
Sharp-shinned hawk	*Accipiter striatus*
Cooper's hawk	*Accipiter cooperii*
Red-tailed hawk	*Buteo jamaicensis*
American kestrel	*Falco sparverius*
Ring-necked pheasant	*Phasianus colchicus*
California quail	*Callipepla californica*
California black rail	*Laterallus jamaicensis coturniculus*
California clapper rail	*Rallus longirostris obsoletus*
Killdeer	*Charadrius vociferus*
Rock dove	*Columba livia*
Mourning dove	*Zenaida macroura*
Great horned owl	*Bubo virginianus*
Anna's hummingbird	*Calypte anna*
Allen's hummingbird	*Selasphorus sasin*
Northern flicker	*Colaptes auratus*
Western flycatcher	*Empidonax difficilis*
Black phoebe	*Sayornis nigricans*
Say's phoebe	*Sayornis saya*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Cliff swallow	*Hirundo pyrrhonota*
Barn swallow	*Hirundo rustica*
American crow	*Corvus brachyrhynchos*
Bushtit	*Psaltriparus minimus*
Hermit thrush	*Catharus guttatus*
American robin	*Turdus migratorius*
Northern mockingbird	*Mimus polyglottos*
Water pipit	*Anthus spinoletta*
Loggerhead shrike	*Lanius ludovicianus*
European starling	*Sturnus vulgaris*
Yellow-rumped warbler	*Dendroica coronata*

Appendix B. Continued

Common Name	Scientific Name
Saltmarsh yellowthroat	*Geothlypis trichas sinuosa*
Brown towhee	*Pipilo fuscus*
Savannah sparrow	*Passerculus sandwichensis*
Song sparrow	*Melospiza melodia*
Golden-crowned sparrow	*Zonotrichia atricapilla*
White-crowned sparrow	*Zonotrichia leucophrys*
Red-winged blackbird	*Agelaius phoeniceus*
Western meadowlark	*Sturnella neglecta*
Brewer's blackbird	*Euphagus cyanocephalus*
Brown-headed cowbird	*Molothrus ater*
American goldfinch	*Carduelis tristis*
House finch	*Carpodacus mexicanus*
Lesser goldfinch	*Carduelis psaltria*
House sparrow	*Passser domesticus*
Mammals	
Virginia opossum	*Didelphis virginiana*
Vagrant shrew	*Sorex vagrans*
Salt marsh wandering shrew	*Sorex vagrans haliocoetes*
Salt marsh vagrant shrew	*Sorex ornatus sinuosus*
Broad-footed mole	*Scapanus latimanus*
Yuma myotis	*Myotis yumanensis*
California myotis	*Myotis californicus*
Silver-haired bat	*Lasionycteris noctivagans*
Big brown bat	*Eptesicus fuscus*
Hoary bat	*Lasiurus cinereus*
Townsend's big-eared bat	*Plecotus townsendii*
Brazilian free-tailed bat	*Tadarida brasiliensis*
Black-tailed hare	*Lepus californicus*
California ground squirrel	*Spermophilus beecheyi*
Botta's pocket gopher	*Thomomys bottae*
Western harvest mouse	*Reithrodontomys megalotis*
Salt marsh harvest mouse	*Reithrodontomys raviventris*
California vole	*Microtus californicus*
San Pablo vole	*Micrutus californicus san pabloensis*
Black rat	*Rattus rattus*
House Mouse	*Mus musculus*
Gray fox	*Urocyon cinereoargenicus*
Raccoon	*Procyon lotor*
Striped skunk	*Mephitis mephitis*

APPENDIX C. Common and Scientific Names of Plant Species Mentioned in the Text

Appendix C. Common and Scientific Names of Plant Species Mentioned in the Text

Common Name	Scientific Name
Trees	
Blue gum eucalyptus	*Eucalyptus globulus*
Grasses	
Wild oats	*Avena fatua*
Soft chess	*Bromus mollis*
Saltgrass	*Distichlis spicata*
Ryegrass	*Lolium multiflorum*
Squirreltail grass	*Sitanion hystrix*
Purple needlegrass	*Stipa pulchra*
Other herbaceous species	
Mustard	*Brassica nigra*
Fennel	*Phoeniculum vulgare*
Bristly ox-tongue	*Picris echioides*
English plantain	*Plantago lanceolata*

Appendix C. Common and Scientific Names of Plant Species Mentioned in the Text

Common Name	Scientific Name
Trees	
Blue gum eucalyptus	*Eucalyptus globulus*
Grasses	
Wild oats	*Avena fatua*
Soft chess	*Bromus mollis*
Saltgrass	*Distichlis spicata*
Ryegrass	*Lolium multiflorum*
Squirreltail grass	*Sitanion hystrix*
Purple needlegrass	*Stipa pulchra*
Other herbaceous species	
Mustard	*Brassica nigra*
Fennel	*Phoeniculum vulgare*
Bristly ox-tongue	*Picris echioides*
English plantain	*Plantago lanceolata*