UNIVERSITY OF CALIFORNIA

RICHMOND BAY CAMPUS Long Range Development Plan

Community Draft

August 12, 2013

Berkeley
UNIVERSITY OF CALIFORNIA

BERKELEY LAB
Lawrence Berkeley National Laboratory

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FOREWORD

Science is about understanding the world around us. Together, we must use that knowledge to make the world a healthier and more prosperous place.

Lawrence Berkeley National Laboratory and the University of California, Berkeley have for decades pushed the boundaries of knowledge in fundamental and applied sciences related to energy, health, and environment. We educate the scholars of tomorrow, and provide them with the most advanced research support in a highly collaborative environment.

We are grateful to the City of Richmond leadership and to the many community members who attended meetings that have been part of the science and rigor of our land use planning. The result of our work together is this Richmond Bay Campus Long Range Development Plan. It is foundational for our future together on this site, in this community, and solidly supports our loftiest goals.

The unique partnership between UC Berkeley and Berkeley Lab, extending over 80 years, needs room to grow. While we continue to rejuvenate our Berkeley campuses, our preferred site to grow together is along the shoreline in Richmond, with its natural beauty in the warmly welcoming Richmond community. The site is a diamond in the rough, due in part to its legacy of heavy industrial use. With implementation of this Long Range Development Plan, including an attractive open campus, multi-modal access, and preserved natural areas, we hope to see this diamond shine.

Here, we put forward a proposal that will transform the site into one that is at once in harmony with the Bay Area ecosystem, a source of knowledge creation for the country, and an engine of economic growth locally and regionally. Like the best of UC Berkeley, Berkeley Lab, and Richmond today, our future must be responsible, beautiful, forward-looking, inclusive and inspiring. We believe that re-developing the Richmond properties as set forth here will help us secure that future.

A. Paul Alivisatos, Director
Lawrence Berkeley National Laboratory

Nicholas B. Dirks, Chancellor
University of California, Berkeley

TABLE OF CONTENTS

Introduction 1.1
- Role of the Long Range Development Plan 1.3
- Process 1.5
- Organization of the Document 1.5

Planning Context 2.1
- Institutional Context 2.2
- Richmond South Shoreline Area Context 2.4
- Regional Access Context 2.8
- Physical Setting 2.8
- Contamination Investigation and Cleanup 2.12
- Climate 2.15
- Topography and Views 2.16
- Sea Level Rise 2.18
- Site Infrastructure 2.20

Vision 3.1
- Science 3.2
- Community 3.4
- Campus Program and Population 3.5
- Site and Facilities 3.8

Plan Elements 4.1
- Land Use 4.2
- Access, Circulation and Parking 4.14
- Open Space and Landscape 4.26
- Utilities and Infrastructure 4.30
- Sustainability 4.36
- Safety and Preparedness 4.40
- Implementation 4.42

Appendices A.1
- Appendix 1: Existing Richmond Field Station Building Inventory A.2
- Appendix 2: Phase I Planning A.6
- Appendix 3: Related Documents A.8
- Appendix 4: Abbreviations and Definitions A.10
- Appendix 5: Acknowledgements A.12

DRAFT

FIGURES & TABLES

Figure 2.1: Site Location 2.3
Figure 2.2: Richmond South Shoreline Area 2.5
Figure 2.3: University of California Richmond Properties 2.9
Figure 2.4: Existing Site 2.11
Figure 2.5: Cleanup Actions 2.13
Figure 2.6: Wind Conditions 2.15
Figure 2.7: Site Topography 2.17
Figure 2.8: Sea Level Rise 2.19
Figure 2.9: Existing Road Network 2.21
Figure 4.1: Land Use Plan 4.3
Figure 4.2: Illustrative Development Scenario 4.11
Figure 4.3: Regional Access 4.15
Figure 4.4: Vehicular Circulation 4.17
Figure 4.5: Section - Lark Drive at Grasslands 4.18
Figure 4.6: Section - Lark Drive at Central Spine 4.18
Figure 4.7: Section - Service Access Street between Buildings 4.19
Figure 4.8: Section - Service Access Street at Grasslands Edge 4.19
Figure 4.9: Section - Central Spine 4.20
Figure 4.10: Pedestrian and Cycling Circulation 4.21
Figure 4.11: Open Space Framework 4.27
Figure 4.12: Domestic and Fire Water 4.32
Figure 4.13: Sanitary Sewer System 4.32
Figure 4.14: Storm Drainage 4.33
Figure 4.15: Electrical Power Distribution 4.34
Figure 4.16: Natural Gas Distribution 4.34
Figure 4.17: Neighborhood Development Phasing 4.43

Table 4.1: Projected Building Space and Population by Neighborhood 4.10
Table 4.2: Projected Parking Demand by Neighborhood 4.23
Table 4.3: Projected Utility Demand 4.31

1 INTRODUCTION

The University of California, Berkeley and the University of California at the Lawrence Berkeley National Laboratory (LBNL) propose to establish a new research campus – the Richmond Bay Campus – in Richmond, California. The purpose of the proposed campus is to build upon the University's record of accomplishment in providing long-term societal benefits through discovery and the advancement of knowledge. UC Berkeley and LBNL's goals for the Richmond Bay Campus are that it will:

1. Advance LBNL and UC Berkeley's tradition of world class science by expanding their strong partnership to the cooperative development of the new campus, in order to augment accomplishments and contributions of both institutions in the fields of human health, the economy, energy, and the environment.

2. Create a premiere research campus as a base for building partnerships on a physically attractive and open site supporting and complementing the teaching, research, and public service programs of UC Berkeley and LBNL.

3. Provide sufficient research, education, and support expansion space to foster synergy and collaboration within and across disciplines and institutions in both the public and private sectors.

4. Catalyze new discoveries, economic revitalization, and community vibrancy by facilitating inspiration along the full spectrum of the research and development enterprise and fostering connectivity with the surrounding community.

Opposite page: View over the Richmond Bay Campus site and the Richmond South Shoreline to the San Francisco Bay, San Francisco, the Golden Gate Bridge, and Marin.

1 INTRODUCTION

The University of California (UC, the University) was founded in 1868 as a public, state-supported land grant institution. The State Constitution established UC as a public trust to be administered under the authority of an independent governing board, the Regents of the University of California. The University maintains ten campuses and oversees one national laboratory, the Lawrence Berkeley National Laboratory. The University's mission is research, teaching, and public service.

UC Berkeley is a flagship campus of the University of California system. It delivers programs of instruction, research and public service of exceptional quality and today educates more than 35,000 students each year from California and across the globe; twenty two faculty members in science, economics, and literature have won the Nobel Prize. UC Berkeley's central campus features an outstanding ensemble of new and historic buildings in a park-like setting along two forks of Berkeley's Strawberry Creek.

LBNL is a federally funded research and development center operated and managed by the University of California Regents under contract with the US Department of Energy (DOE). The research, service, and training work conducted at LBNL are within the University's mission. As the LBNL Management and Operating (M&O) contractor, the University is responsible for providing the intellectual leadership and management expertise necessary and appropriate to manage, operate, and staff the Laboratory; accomplishing the missions and activities assigned and funded by DOE to the Laboratory; administering the DOE UC Prime Contract; and providing University oversight of contract compliance and performance. "LBNL", as used within this document, refers to both the national federally funded research and development center named the Lawrence Berkeley National Laboratory and to the University of California in its role as the M&O contractor of the Lawrence Berkeley National Laboratory.

The mission of the DOE is to ensure America's security and prosperity by addressing energy and environmental challenges through transformative science and technology solutions. LBNL conducts unclassified research across a wide range of disciplines to deliver science-based solutions to problems of national significance, with a strong emphasis on energy and environmental research. LBNL is the nation's first national laboratory, established on the UC Berkeley campus in 1931; since that time, it has been associated with thirteen Nobel prizes. Nobel laureates at LBNL, including George Smoot, Steven Chu, Melvin Calvin, Ernest Orlando Lawrence, and Saul Perlmutter have held positions on the UC Berkeley faculty. The main LBNL site is located on land owned by the University adjoining the UC Berkeley campus. LBNL scientific research and operational units are also located in leased spaces in a variety of East Bay cities.

Co-location of UC Berkeley and LBNL programs at the Richmond Bay Campus will benefit both institutions and their research. The histories of UC Berkeley and LBNL have been intertwined since the founding of LBNL by Ernest Orlando Lawrence, and both have richly benefited from co-location and synergies at their existing sites in Berkeley. Hundreds of UC Berkeley faculty members hold joint appointments at LBNL; and many UC Berkeley undergraduate and graduate students conduct research at LBNL as part of their degree programs. The partnership helps both institutions recruit and retain top students and scientists from around the world. Development of the Richmond Bay Campus will further build that synergistic relationship for the benefit of LBNL, UC Berkeley, the local community, and the nation.

While LBNL and UC Berkeley have a close existing partnership, they are distinct administrative entities of the University. Upon determination by the Regents to approve the 2014 Long Range Development Plan and certify the associated Environmental Impact Report, UC Berkeley and LBNL are expected to establish a joint committee to oversee operations at the site. The committee will advise the LBNL Director and the UC Berkeley Chancellor on strategic and operational matters. However, UC Berkeley will continue to have ultimate administrative control of, and responsibility for, the Richmond properties (see also the Implementation section).

The Richmond Bay Campus properties will continue to be owned by the University while some of the facilities developed on the site will be used by LBNL to accomplish the missions and activities assigned and funded by DOE. Since it will be a joint use campus, some of the existing buildings as well as new buildings on the site will be occupied by UC Berkeley teaching and research programs. In addition to compliance with LRDP policies, design

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and construction of an individual facility will comply with appropriate legal and regulatory requirements according to its funding source. The laws, regulations, and policies that will apply to the operation of an individual facility will depend on the organization occupying the facility. It is expected that facilities occupied by LBNL programs or UC Berkeley programs will be maintained and operated by LBNL or UC Berkeley, respectively. New facilities developed by private sector entities will be subject to operational oversight by either LBNL or UC Berkeley, as determined by the LBNL Director and the UC Berkeley Chancellor with advice from the joint operating committee.

ROLE OF THE LONG RANGE DEVELOPMENT PLAN

A Long Range Development Plan (LRDP) is defined as a "physical development and land use plan to meet the academic and institutional objectives for a particular campus or medical center of public higher education" (Public Resources Code of the State of California Section 21080.09). It is a comprehensive document that establishes the land use patterns and relevant policies to guide the implementation of facilities and infrastructure development. This LRDP establishes overarching goals and strategies to guide the long-term development of the Richmond Bay Campus through the year 2050, and:

- establishes a framework to achieve development goals for the University's Richmond properties identified by UC Berkeley in its 2002 RFS working paper, chiefly: develop the properties to create a premiere research facility supporting and complementing teaching, research, and public service programs of the University.
- communicates a vision of the Richmond Bay Campus as a physically attractive open site where sensitive natural resources are preserved and the local communities are enriched by the research and development enterprise.
- underpins entitlement of up to 5.4 million gross square feet of research, education, and support space capacity and related utility and transportation infrastructure.
- identifies the need for transportation improvements that connect the campus locally, regionally, and to LBNL and UC Berkeley.
- promotes the achievement of ambitious sustainability goals in a manner that is transparent, uses resources efficiently, and cultivates a living laboratory.
- guides campus development in a fiscally responsible manner which leverages capital investment to address existing legacy brownfield conditions in accordance with sustainable land use best practices.

This Richmond Bay Campus LRDP is accompanied by environmental review as required by the California Environmental Quality Act (CEQA). Environmental review includes descriptions of the site and analysis of potential impacts that could result from the development program identified in this LRDP. The environmental impact analyses are based primarily on the 2014 LRDP Land Use Plan and an illustrative development scenario (IDS). The IDS is a conceptual portrayal of the Richmond Bay Campus at full implementation of this 2014 LRDP consistent with its goals, campus program and population projections, and Land Use Plan.

A Physical Design Framework (PDF) document is being prepared as a companion to this LRDP. The PDF articulates in more detail the vision for the physical form of the campus and serves as a foundation for the specific planning and design of future projects. The PDF will augment the design guidance presented in this LRDP with additional details to guide the design and architecture of the campus.

Development projects at the Richmond Bay Campus must be consistent with the Land Use Plan and policies set forth in this LRDP and advance the achievement of the Scientific, Community, and Facilities Visions as stated herein. The LRDP does not commit the university to any specific project, but rather provides the strategic framework for decisions on those projects.

Three community workshops were held at the Richmond Civic Center in 2012 to inform and engage community members.

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PROCESS

This LRDP has been prepared with the participation of scientists, faculty, and staff from UC Berkeley and LBNL, in parallel with numerous meetings with City of Richmond staff, stakeholders, and the broader community. Individual interviews, group meetings, and visioning sessions were very important in identifying a program and vision for the site, as well as key facility and campus amenities.

Initial planning for the Richmond Bay Campus began in 2011, when LBNL solicited qualifications from candidate sites on which to build a second campus. UC Berkeley submitted a response proposing the Richmond site. Since LBNL's identification of the Richmond properties as the preferred site in 2012, planning efforts have included workshops with UC Berkeley and LBNL faculty and staff. Four workshops focused on transportation, campus character, utilities, and sustainability resulted in the identification of principles to guide Richmond Bay Campus planning and development. Community workshops in 2012 and 2013 focused on the science envisioned for the new campus, architectural and site character, and the Long Range Development Plan.

A list of those involved in the preparation of this document is included in the Acknowledgements section of the Appendices.

ORGANIZATION OF THE DOCUMENT

This LRDP is organized in three sections:

Planning Context

This section provides the context for the project, including descriptions of the need for the new campus and the character and conditions surrounding the site.

Vision

This section articulates the nature of the scientific research to be conducted at the Richmond Bay Campus and the anticipated symbiotic relationship between LBNL, UC Berkeley, and the City of Richmond. It also introduces the physical design vision, intended to realize a campus plan that models sustainability while fostering collaboration and innovation.

Plan Elements

Each element of this LRDP generally summarizes the context and the planning framework, and defines the overarching and specific sub-policies UC Berkeley and LBNL will employ to meet their long-term facilities needs and support their daily operations. The following elements appear in this section:

- Land Use
- Access, Circulation and Parking
- Open Space and Landscape
- Utilities and Infrastructure
- Sustainability
- Safety and Preparedness
- Implementation

2 PLANNING CONTEXT

The Richmond Bay Campus will occupy a remarkable 134-acre site located in the City of Richmond, approximately eight miles from the UC Berkeley campus and the LBNL main site in the Berkeley hills. The waterfront site along Richmond's South Shoreline offers unique opportunities to create a special research and development environment that will support team science, act as a catalyst for related development on nearby properties, and be a key element in the ongoing revitalization of the Richmond waterfront.

Opposite page: View southeast from the San Francisco Bay Trail to the Berkeley hills.

INSTITUTIONAL CONTEXT

UC Berkeley's core campus is located on approximately 180 acres of land owned by the Regents of the University of California in Berkeley, California. In 1950 UC Berkeley purchased and currently administers the University-owned parcels in Richmond, California that became the Richmond Field Station to facilitate large-scale research conducted by faculty and students in the College of Engineering. The property currently accommodates a wide range of research and resource conservation values.

Since the mid-1980s the Berkeley campus has explored ways to broaden and intensify usage of the Richmond Field Station including drafting a master plan in 1993 which was never formally adopted. In 2002 a committee of faculty and staff convened to identify potential future programs for the site and establish a set of principles for its development. The study concluded that UC Berkeley's Richmond property…

> …is the principal land resource available to the UC Berkeley campus to help meet its long-range demand for additional research space. The site's assets, particularly its accessibility to the greater Bay Area, attractive bayside setting, natural habitat areas and proximity to private and governmental R&D development in the Richmond South Shoreline, coupled with its significant development capacity, provide the University with the opportunity to create a premiere research facility supporting and complementing teaching, research and public service programs of the UC Berkeley campus… The research campus should be incorporated as seamlessly as possible into the fabric of the UC Berkeley campus as its major property asset and as an early option for expansion of programs, primarily in the areas of research and public service. It must be viewed as an integral, complementary component of the UC Berkeley campus, and should include as broad an array of disciplines as is feasible and desirable.

In 2007, UC Berkeley acquired the 3200 Regatta parcel adjacent to the Richmond Field Station. The warehouse building on this parcel houses the UC Berkeley museum and research collections as well as spaces leased to private businesses.

LBNL is located on approximately 200 acres of land owned by the Regents of the University of California in the cities of Berkeley and Oakland in the hill area adjacent to the UC Berkeley campus. Elevations on the site range from 500 to 1,000 feet above sea level. The hillside site, comprised of numerous steep slopes and isolated level areas, constrains development in clusters of facilities serving synergistic programs. The varied topography of the site makes access between facilities challenging. There are approximately 1.6 million square feet of scientific, administrative, and operations building space on the main campus.

Interaction between LBNL and UC Berkeley is greatly facilitated by close proximity. Each has an LRDP to guide development at their main campus sites, and the institutions share land boundaries; staff, faculty and students collaborate closely, travelling easily between the two sites or gathering in the vicinity. Research programs from both institutions co-occupy more than fifteen buildings on the UC Berkeley campus.

LBNL also occupies leased space in locations around the Bay Area to accommodate growing programs, resulting in more than 20% of the Lab employees presently working in off-site space, dispersing resources and constraining opportunities for synergy and collaboration.

In 2010 Laboratory Director Alivisatos announced a new initiative to consolidate LBNL bioscience programs located in geographically dispersed leased facilities and provide space to expand other existing and future programs on a second LBNL site. In January 2011 LBNL issued a Request for Qualifications (RFQ) for the purpose of identifying a short list of properties that best met a set of seventeen attributes desirable for a second site.

LBNL's RFQ listed a need for a site that could accommodate up to 2 million square feet (SF) of research and operational facilities for consolidation of

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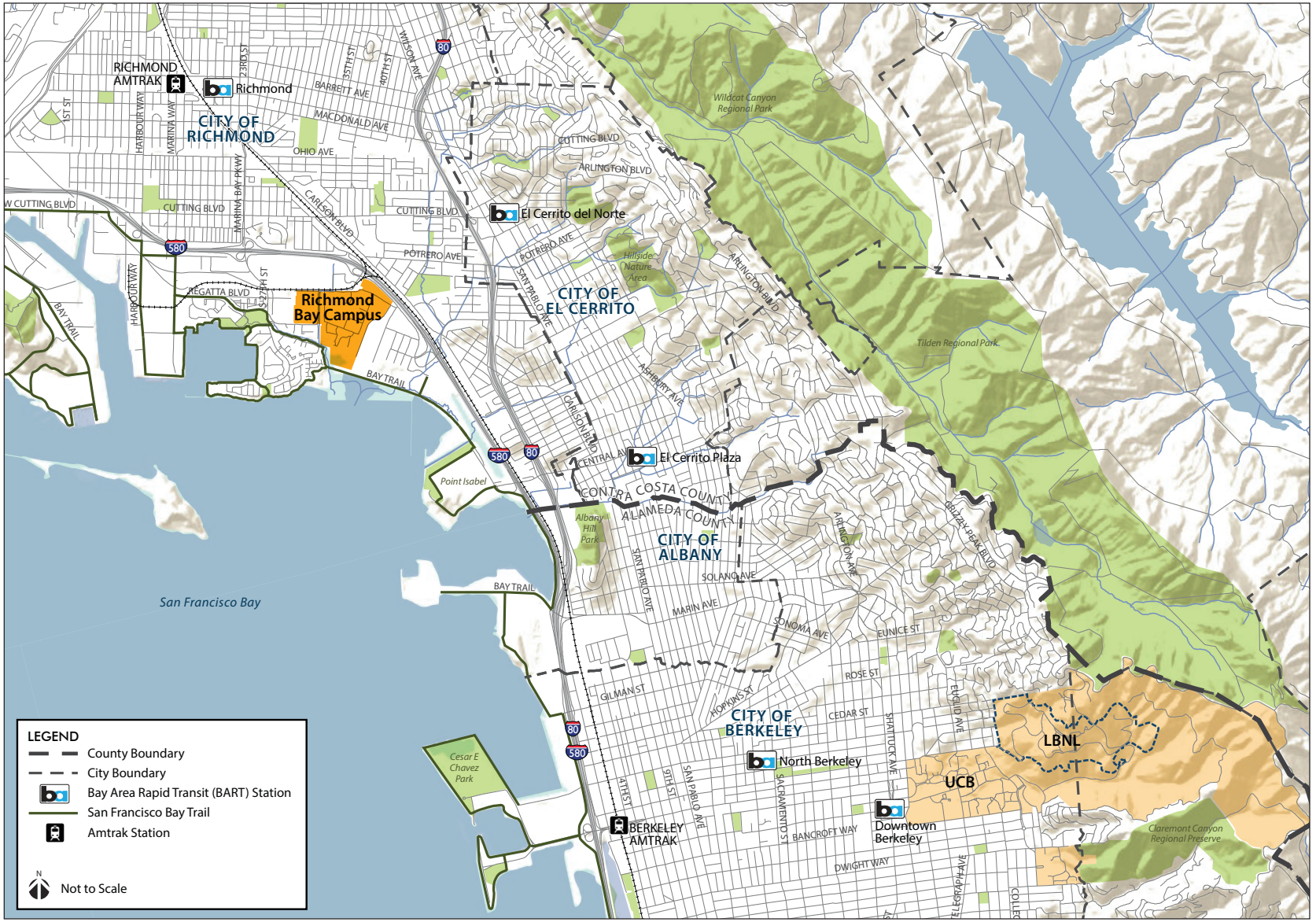
Figure 2.1: *Site Location*



programs in leased facilities, future expansion of its programs at the main site, and to house programs from synergistic public and private entities compatible with LBNL's mission.

Over twenty submittals were received in response to the RFQ and a short list of six sites was identified for further evaluation, including UC Berkeley's submittal for the upland portion of the Richmond Field Station and the Regatta property. In January 2012 LBNL identified these University of California Richmond properties as the preferred location for a second LBNL site. Primary reasons for identifying the Richmond properties as the preferred site included the ability to co-develop the campus with UC Berkeley, the welcoming community of Richmond, and the long-term control of land for expansion as needed. In total, the upland portions of the Richmond Field Station plus the 3200 Regatta parcel constitute approximately 134 acres. These acres comprise the Richmond Bay Campus and are the subject of the Richmond Bay Campus LRDP.

The development goals for the Richmond properties identified by UC Berkeley in its 2002 RFS working paper require a significant amount of space in addition to LBNL's 2 million SF of capacity. The Richmond Bay Campus has a total capacity for approximately 5.4 million SF of building space - well within the density limits of what is allowed for owners of adjacent properties subject to the City of Richmond zoning restrictions. It is projected that 650,000 SF of existing facilities will remain on site with 4.75 million SF of capacity available for new UC Berkeley and LBNL building space.

RICHMOND SOUTH SHORELINE AREA CONTEXT

The proposed Richmond Bay Campus site is located on UC Berkeley-administered property fronting the San Francisco Bay in the South Shoreline Area of the City of Richmond (see Figure 2.2). Richmond has a population of over 100,000 in an area of 34 square miles and over 32 miles of shoreline. The City is well known for its role in the World War II home front effort as it was the location of four Kaiser shipyards, the most productive in the nation, and launched 747 ships during the war. Tens of thousands of workers came from all over the United States to work in these wartime industries. During that period the City, particularly the downtown, was a thriving, bustling place. Following the war, many who had come for the war effort stayed, but employment declined precipitously. In recent years, success in redeveloping portions of the waterfront, the Civic Center, and other parts of the City points to a revitalization of Richmond. Developing the Richmond Bay Campus will be an important and continuing part of this revitalization.

The South Shoreline Area is located at the southernmost edge of the city between Interstate 580 (I-580) and the San Francisco Bay. Historically, this area was the site of a variety of manufacturing and industrial uses, a number of which remain. These manufacturing and industrial uses were largely insensitive to the ecology of their bayfront properties. The grasslands on the Richmond Bay Campus site are, therefore, a rare example of the original landscape; but the site also reflects its manufacturing legacy in contaminants found in soils and groundwater to this day.

In recent years, westerly portions of the city's southern waterfront have been revitalized. The Ford Assembly Building, in particular, is a success story. Formerly the Ford Motor Company Assembly Plant, the largest Ford plant built on the west coast, the building was converted to wartime production use during World War II. Now part of the Rosie the Riveter World War II Home Front National Historical Park, it has been completely renovated, houses businesses such as Sun Power and Mountain Hardwear, and includes a new conference center, restaurant, and a venue for special events. The National Park Service Visitor Education Center is located next to the Ford Assembly Building. In addition, waterfront parks, other restaurants, shopping centers,

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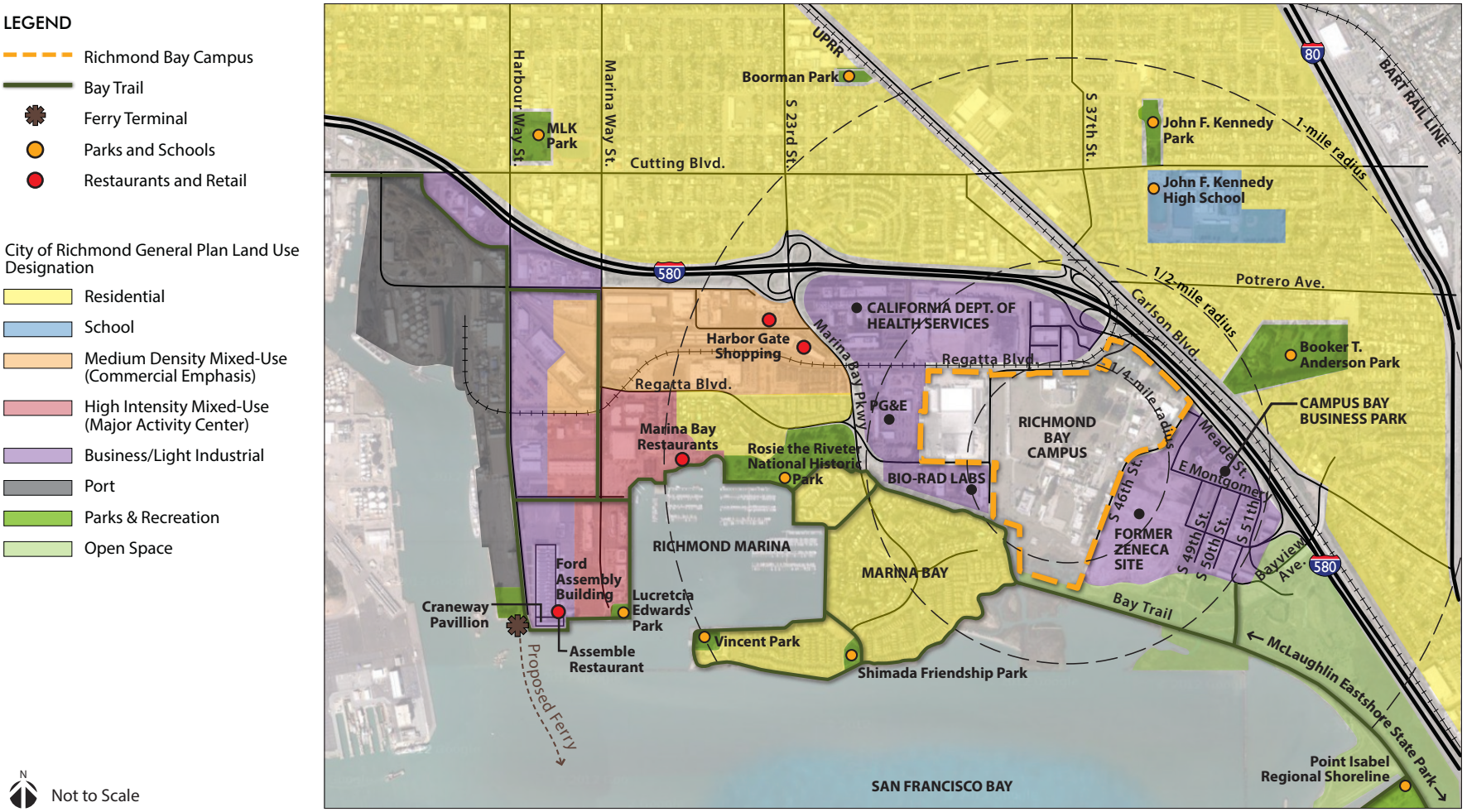
Figure 2.2: *Richmond South Shoreline Area*

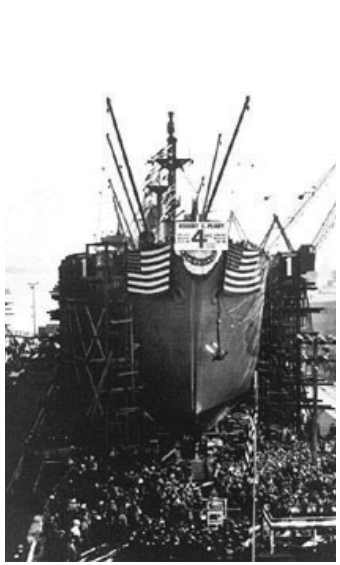


a marina, and newer residential neighborhoods have been developed in the South Shoreline Area. Land uses immediately adjacent to the Richmond Bay Campus site are industrial, office, and transport, along with the Marina Bay single- and multi-family residential neighborhood immediately to the southwest. Arterial roadways, the Union Pacific Railroad tracks, and I-580 define the northern boundaries of the site. The California Department of Health Services is located to the northwest. A Pacific Gas and Electric (PG&E) service station and Bio-Rad Laboratories, a private research equipment manufacturing company, form the site's western boundary. The adjacent property to the east is the location of former chemical production operations previously owned by Zeneca. The Campus Bay Business Park is located on part of this site adjacent to the Bayview Avenue / I-580 interchange.

Major state and regional parks, the McLaughlin Eastshore State Park and the Point Isabel Regional Shoreline, lie to the southeast of the site and extend to the southern city limits.

The City of Richmond's vision for the South Shoreline Area is to transform this currently-underutilized industrial waterfront area into a revitalized, pedestrian-oriented district which will integrate a mixture of high-intensity research, development, and commercial uses with new medium-density housing anchored by the Richmond Bay Campus. The vibrant mix of new and existing uses will harmonize with ecologically-sensitive areas, maximize bay views, and provide efficient connections to a broad range of existing and future transportation options and regional transportation routes. The City believes that new investment within the South Shoreline Area has the potential to strengthen surrounding neighborhoods, generate new community economic development opportunities, and increase the use of public transit.

The Richmond Bay Campus has the potential to be the catalyst for a nationally-recognized innovation district. Similar Bay Area districts anchored by important institutions or private firms include LBNL and UC Berkeley, UCSF Mission Bay in San Francisco, and the biotech cluster east of Highway 101 in South San Francisco.



The Kaiser shipyards (top left and right), located on the waterfront west of the Richmond Bay Campus site, were instrumental in the World War II ship building effort. The newly renovated Ford Assembly Building (bottom), was formerly a Ford Motor Company Assembly Plant that during World War II was converted to wartime production use.

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The land uses in the vicinity of the Richmond Bay Campus include (clockwise, from upper left) the Marina Bay residential community, the Bay Trail near the Richmond Bay Campus site, the Rosie the Riveter WWII Home Front National Historic Park, the adjacent vacant property formerly owned by Zeneca, and the residential community on Regatta Boulevard near Northshore Drive.

REGIONAL ACCESS CONTEXT

The site is served by relatively direct vehicular access. Two Interstate 580 freeway interchanges, Bayview Avenue and Regatta Boulevard, provide direct access via Meade Street; more indirect access can be gained from the Marina Bay Parkway/23rd Street interchange. Three BART stations are located within three miles of the site: Richmond (which also has an Amtrak station), and El Cerrito del Norte and El Cerrito Plaza (which have AC Transit and other bus system connections) (see Figure 2.1). A limited number of shuttles run between the UC Berkeley campus and the site on weekdays.

Bicycle access to the site is convenient from all directions. The San Francisco Bay Trail, a 330-mile (eventually to be 500 miles) bayfront multi-use trail that has been implemented regionally for more than the last two decades, passes along the Richmond South Shoreline Area, including along the bay frontage of the Richmond Bay Campus. The Bay Trail provides a continuous connection between the cities of Richmond, El Cerrito, Albany, Berkeley and Emeryville. Bicycle access to the City of Richmond in the easterly and northern directions is also convenient via the Bayview Avenue, Regatta Boulevard, and Marina Bay Parkway/23rd Street overpasses.

A ferry terminal is proposed for the South Shoreline Area near the Ford Assembly Building with a direct connection to and from San Francisco and commuter service projected to begin in 2015. This terminal would be less than three miles from the Richmond Bay Campus by motor vehicle or a 15-minute bicycle ride on the Bay Trail.

PHYSICAL SETTING

The proposed site of the Richmond Bay Campus is located directly south of the Regatta Boulevard / I-580 freeway interchange in the city of Richmond. The University owns four parcels here: a 109.8-acre parcel that contains the currently developed upland portion of the Richmond Field Station (RFS); a 24.0-acre developed parcel along Regatta Boulevard immediately west of the RFS, acquired in 2007 and currently referred to as the Regatta Site; and two parcels in the San Francisco Bay comprising 46.1 and 15.6 acres, respectively (see Figure 2.3). The University also has a 0.6-acre ownership interest in a portion of South 46th Street along the eastern border of the RFS. Under UC Berkeley's land use authority, LBNL and UCB propose to cooperatively develop portions of the RFS, Regatta, and South 46th Street properties, totaling approximately 134 acres, as the Richmond Bay Campus.

The Richmond Field Station has been managed by UC Berkeley since 1950, frequently accommodating research projects which could not be accommodated on the main campus. Current facilities include one of the world's largest earthquake shaking tables (see peer.berkeley.edu); test facilities for advanced transportation research; the Northern Regional Library Facility (NRLF), an archive facility of the University of California system; and a privately developed regional laboratory for the US Environmental Protection Agency (EPA). Current activities also include research and teaching in integrative biology and art practice. The Regatta site includes over 400,000 gross square feet (gsf) of warehouse space, and houses UC Berkeley archives and museum collections and some private sector tenants.

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Figure 2.3: *University of California Richmond Properties*

The existing buildings on the Richmond Bay Campus site total to over 1 million gsf of floor space. These buildings range from older buildings that are remnants of previous operations on the site to newer structures that have been purpose-built for current research activities. Appendix 1 lists all of the existing facilities on the site, and includes information on size, year built, and structural condition. With the exception of the US EPA and NRLF facilities, all of the existing buildings will be replaced as the Richmond Bay Campus is developed; existing programs housed in space to be demolished will be accommodated within other LBNL or UC Berkeley space.

The existing buildings on the Richmond Bay Campus site vary widely in age and style, as can be seen above (clockwise from upper left): the Northern Regional Library Facility (NRLF), US Environmental Protection Agency (EPA) building, Pacific Earthquake Engineering Research Center (PEER), RFS Administrative Offices (ADMIN), Regatta Building, and Transportation Sustainability Research Center (TSRC).

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Figure 2.4: *Existing Site*

LEGEND

- Property Boundary
- Disturbed Coastal Terrace Prairie
- Non Native Grassland & Mixed Ruderal Scrub
- Coastal Terrace Prairie
- Other Grasslands/Open Space
- Wetlands
- Restored Native Upland
- Surface Water
- Eucalyptus Stands
- Trees
- Existing Buildings
- **NRLF** Northern Regional Library Facility
- **EPA** US EPA Region 9 Laboratory
- **PEER** Pacific Earthquake Engineering Research Center
- **ADMIN** Richmond Field Station Administrative Office (formerly Forest Products Laboratory)
- **TSRC** Transportation Sustainability Research Center

Source: *Habitat and Wetlands Map, Current Conditions Report,* Tetra Tech, November 2008.

0 150 300 600'

CONTAMINATION INVESTIGATION AND CLEANUP

Between the mid-1800s and the late 1900s, the Richmond South Shoreline Area was home to numerous assembly and chemical manufacturing facilities, including the Kaiser Shipyards and Stauffer Chemical. The California Cap Company manufactured blasting caps, shells, and explosives on portions of the Richmond Bay Campus site from the 1870s to the 1940s. When the University of California purchased the property in 1950 it obtained space and facilities for expanding research and academic programs for a growing post-WWII student population. However, along with owning the property the University became responsible for addressing legacy contamination from industrial activities that occurred prior to UC ownership.

In 1999 the University began investigating site contamination under the oversight of the California Environmental Protection Agency's (Cal EPA's) San Francisco Bay Regional Water Quality Control Board. The main contaminants identified were metals from the California Cap Company's mercury fulminate manufacturing plant and pyrite cinder waste that originated from sulfuric acid production at the former neighboring Stauffer Chemical plant. The metals included arsenic, cadmium, copper, lead, mercury, selenium, and zinc, some of which can be toxic to humans and wildlife if ingested (eaten) or inhaled as dust. Portions of Western Stege Marsh also contained low pH (acidic) orange-stained ground water and sediments resulting from pyrite cinders disposed of in the marsh. In addition, an isolated area of polychlorinated biphenyl (PCB) contamination was found at a storm drain outfall in Meeker Slough.

UC Berkeley established a multi-year program to remove contaminants from the site. Work began in 2002 with removal of the largest areas of contaminated soil which were excavated, treated, and transported off-site to approved treatment and disposal facilities. Excavated areas were replaced with clean bay mud or clean dirt and restored with native marsh and coastal terrace prairie plants.

In 2005, after completion of removal of the major source areas, investigation and remediation oversight was transferred to the California EPA's Department of Toxic Substances Control (DTSC). DTSC required additional soil and groundwater sampling of the upland portions of the site in addition to requiring the owner of the neighboring former Stauffer Chemical site to investigate and cleanup areas of groundwater contamination at the property boundary. In 2008 the California Department of Public Health and the Federal Agency for Toxic Substances Control and Disease Registry completed a Public Health Assessment for the Richmond Field Station and determined the site to be safe for normal activities.

Based on the investigations completed through fall 2012, UC Berkeley has prepared a Removal Action Workplan (RAW) under Health and Safety Code Section 25365.1(h)(1) which describes cleanup actions and land use controls that address the remaining soil contamination in developable portions of the Richmond Bay Campus within the RFS site and groundwater contamination beneath the RFS site. The RAW is proposed for approval by DTSC in 2014 subsequent to a public review process. Areas requiring additional cleanup action under the proposed RAW (see Figure 2.4) include the following:

- Soil contamination: Mercury contamination in the former mercury fulminate plant area and soil around former transformer locations which have low-level PCB contamination.
- Groundwater contamination: Carbon tetrachloride (CT) in the northwest uplands.

In addition, under the proposed RAW, monitoring, assessment, and management of contaminated soil and groundwater at the site will be conducted in accordance with land use controls. A deed restriction will limit the types of groundwater and land uses allowable at the RFS portion of the Richmond Bay Campus, and a soil management plan (SMP) will govern redevelopment activities in a manner which protects public health and protects against environmental hazards. The SMP will provide a framework to assure that soil management is conducted in a manner which is safe to the RFS community and that soils are disposed of offsite or re-used onsite in accordance with the requirements of DTSC and other agencies as applicable. The remedy for TCE-impacted groundwater originating from the former Stauffer chemical site is subject to the Zeneca Site Investigation and Remediation Order.

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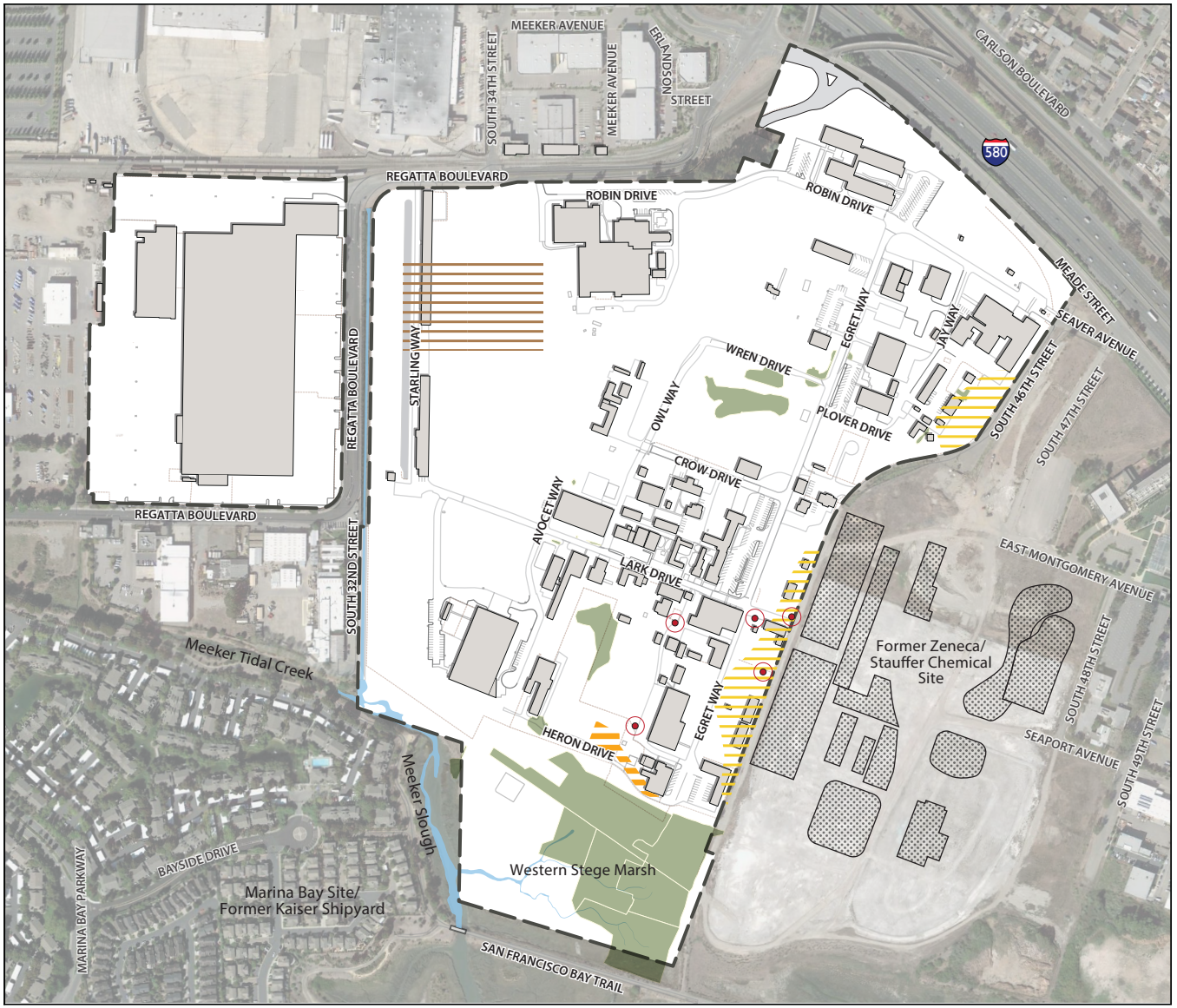
Figure 2.5: *Cleanup Actions*

LEGEND

- Property Boundary
- Existing Buildings
- Historical Manufacturing Area on Former Zeneca/Stauffer Chemical Site
- Completed Remediation
- Proposed Removal Action: Mercury Fulminate Area
- Proposed Removal Action: PCB Areas
- Approximate Evaluation Area for Treatment of Carbon Tetratchloride (CT)
- Approximate Evaluation Area for Treatment of Trichloroethylene (TCE)

Cleanup Actions Source: *Removal Action Workplan,* Tetra Tech, 2013.

Former Zeneca/Stauffer Chemical Site Historical Information Source: *Current Conditions Report, Lot 3, 1200 South 47th Street, Campus Bay, Richmond, California,* LFR Levin Fricke, July 29, 2005.



NATURAL FEATURES

Its waterfront location and natural features give the Richmond Bay Campus a distinctive character. The site and adjacent waterway feature natural areas prized for their aesthetic, research, and habitat value, including coastal terrace prairie grasslands, Western Stege Marsh, and Meeker Slough (see Figure 2.5).

Perennial grasslands once dominated the California landscape, but the introduction of cattle, development, and competitive non-native species severely challenged the native grassland communities. A remnant of the original coastal grasslands, known as coastal terrace prairie, exists on the University's Richmond properties. These grassland areas are among the few remaining coastal terrace prairie on lowland clay soils in the greater East Bay region. The grasslands provide habitat for small species of reptiles and amphibians, as well as seed- and insect-eating mammals and birds. UC Berkeley students and faculty have long studied these resources, which provide unique opportunities for field research.

The Western Stege Marsh is located at the southern edge of the site and consists of approximately nine acres of waterlogged land including mudflats and tidal wetlands. Meeker Slough is the continuation of Meeker Tidal Creek, which flows from the west and bends southward at Western Stege Marsh where it drains to San Francisco Bay. UC Berkeley has completed extensive remediation and restoration of the Western Stege Marsh and monitoring of these natural areas continues. Western Stege Marsh and Meeker Slough provide nesting and foraging habitat for a number of birds and shorebirds, as well as foraging and drinking areas for bats. This tidal marsh is also known habitat for the special-status California Clapper Rail (Rallus longirostris obsoletus), which is a medium-sized bird that rarely flies.

The Richmond Bay Campus site has five stands of tall eucalyptus trees and a total of approximately 1,300 trees. The stands were planted as wind breaks and blast mitigation by the California Cap Company. While not native, the eucalyptus trees serve as a visual landmark on the site. The largest stand of eucalyptus provides habitat for raptors and wintering monarch butterflies. The eucalyptus trees also conflict with other biological values, are prone to limb breakage, and are a fire hazard.

The coastal terrace prairie in the central part of the campus is a rare and valuable ecosystem (top). Meeker Slough (bottom), at the southern end of the campus, is a productive estuarine habitat, attracting numerous birds and bats.

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CLIMATE

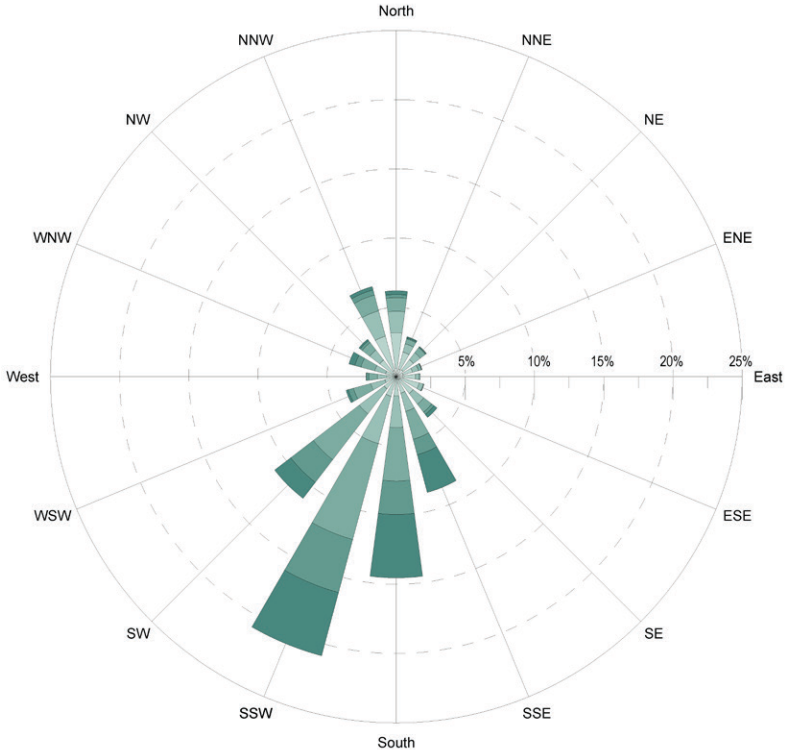
The Richmond South Shoreline Area enjoys a very mild Mediterranean climate year-round. The temperature is slightly warmer than in the coastal areas of San Francisco, the Peninsula, and Marin County. It is, however, more temperate than areas further inland. The average highs range from 57 to 73°F and the lows between 43 and 56°F year-round. September is, on average, the warmest month and January is, on average, the coldest month. The highest recorded temperature in Richmond was 107°F in September 1971 while the coldest was 24°F in January 1990.

The average annual wind speed is 6 to 9 miles per hour primarily from the direction of the San Francisco Bay (see Figure 2.6). It is generally windier from March through August than in other months and the strongest winds typically occur in June.

The rainy season typically begins in late October and ends in April with some showers in May. Most of the rain occurs during stronger storms in November through March when rainfall is usually three to five inches per month. Most precipitation occurs during January and February. Seasonal wetlands are known to occur throughout the Richmond Bay Campus site during the rainy season. The area experiences no snowfall but has brief hail storms annually during the coldest months.

The City of Richmond experiences sunshine more than 80% of the daylit hours during seven months out of the year and there are ten months where 60% or more of the daylit hours experience sunshine. December and January are the darkest months with about 45% average brightness. The South Shoreline Area and the ridges of the East Bay hills experience more fog than do the northern areas of Richmond. Morning humidity is 75% to 92% year round. Afternoon humidity ranges from 20-40% May through October (the summer months) and from 40-70% during the winter.

Figure 2.6: *Wind Conditions*



Wind Speed Categories (meters per second)

- > 0.5 - 2
- > 2 - 4
- > 4 - 6
- > 6 - 9
- > 9 - 11
- > 11

NOTES:
1) Orientation of wind rose is the same as the Richmond Bay Campus plans in this document
2) A wind rose is a graphical representation of the frequency of occurrence of wind speed ranges coming out of a given direction. Spikes indicate percent of time wind is blowing FROM the listed direction.
3) Average wind speed: 3.04 miles per hour
4) Maximum wind speed: 34.9 miles per hour ("maximum" represents greatest of the hourly averages; i.e., not a true wind gust)

Source: Bay Area Air Quality Management District (BAAQMD). Data from monitoring site at Richmond Field Station, 2000-2005.

TOPOGRAPHY AND VIEWS

The Richmond Bay Campus site is nearly level, as shown in Figure 2.7, with a grade difference of 20 feet from the high point near Meade Street to the lowest areas near the Western Stege Marsh. The terrain also slopes downward from east to west with the same 20 feet grade difference as north to south. The site's elevation is above the nearby freeway but is similar to adjoining properties in the South Shoreline Area. The gentle slope of the site allows gravity flow of all storm drainage ultimately to Meeker Slough. An existing City of Richmond storm drain channel adjoining Regatta Boulevard carries storm water from the watershed area north of the site, and from the western portions of the campus, into Meeker Tidal Creek. Meeker Tidal Creek is tidally influenced and discharges to Meeker Slough on City of Richmond property to the west of Western Stege Marsh.

Off-site distant views from the campus are possible in nearly 360 degrees of orientation. To the west Mount Tamalpais and the Marin Headlands are visible; to the southwest the San Francisco skyline, Treasure Island, and Bay Bridge can be seen; and to the east and north are the hills above Oakland, Berkeley and El Cerrito. The low-lying and flat nature of the site, however, means that views of San Francisco Bay, the waterfront, and marshes are best experienced from viewpoints close to the marsh.

The Richmond Bay Campus commands dramatic views from East Bay to Marin. From the south, the views are over Western Stege Marsh to the San Francisco Bay and the San Francisco skyline (above). From the NRLF building (below), the view west spans from Angel Island to Marin County, including Mount Tamalpais.

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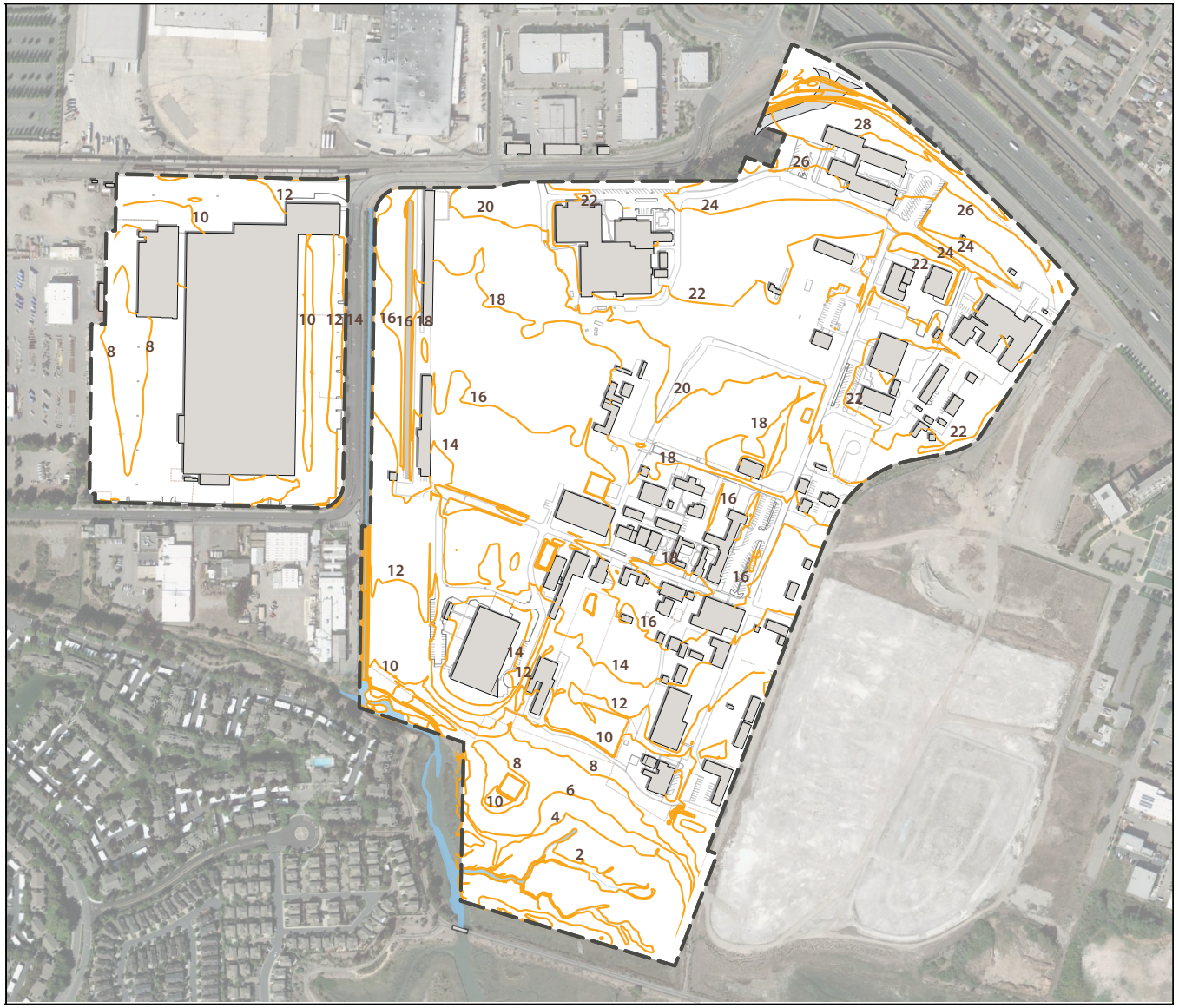
Figure 2.7: *Site Topography*

LEGEND

Property Boundary

18 Elevation Contour Line (feet)

NOTE: Elevations relate to the Sea Level Datum of 1929 (NGVD 29).



0 150 300 600'

SEA LEVEL RISE

Water levels in the San Francisco Bay have risen nearly eight inches over the past century. Climate change is expected to increase the rate of sea level rise globally over the next century. The San Francisco Bay Conservation and Development Commission (BCDC) has regulatory authority over development along the shoreline. BCDC's sea level rise guidance is based on a projected increase in sea level of 16" by year 2050 and 55" by year 2100 (BCDC, 2009)[1]:

The areas that are now Western Stege Marsh and the transition area just north of the marsh were historically intertidal mudflats. The 1959 construction of the embankment which now supports the Bay Trail allowed soil deposition and transition of the mudflats to the tidal marshland which exists today. The transition area may be at risk of inundation from San Francisco Bay storm surge, Meeker Slough flooding, and to a lesser extent, wind-driven waves.

The severity of flood risk is highly dependent on the condition of the fronting shore. The Bay Trail embankment to the south of the marsh serves to shelter the site from waves, although tidal and storm drain waters connect the marsh and the bay via an opening under a foot bridge. The tidal marsh further limits the risk of transition area inundation due to its capacity to dissipate surge and seiche events.

The Mean Higher High Water (MHHW) for 2013 shown on the +3.4' elevation contour[2] in Figure 2.8 is the arithmetic average of the elevations of the higher high water levels (commonly observable) over a 19-year period on the Richmond shoreline. The MHHW for 2100 is projected to be 4.5' higher than in 2013 and correspond to the +7.9' elevation contour.

The Federal Emergency Management Agency (FEMA) maps the current extent of potential for extreme flooding as part of the National Flood Insurance Program. The 2009 FEMA Flood Insurance Rate Map (FIRM) indicates that the transition area may be in a flood inundation zone during a 100-year event[3], with a water level corresponding to approximately the +11' elevation contour. This is contradictory to the FIRM's stated Base Flood Elevation of +6.2' (shown as +9.0' NAVD on the map). Nonetheless, Figure 2.8 shows the 2013 inundation flood limit as indicated on the FEMA FIRM for the sake of consistency.

Sea level rise will increase the extent of the flood hazards. With a 55" sea level rise, projections for the year 2100 100-year event inundation flood limit at the Richmond Bay Campus range from +10.7' to +12.5' with no engineered controls such as the Bay Trail embankment.

The Bay Trail embankment in its current configuration will be regularly overtopped by bay water with sea level rise as projected for year 2100. In this scenario it is likely that the bay water will inundate the marsh, reducing sediment deposition, and over time the marsh would revert back to intertidal mudflats. If the Bay Trail embankment is fortified to continue as an effective wave barrier, the Western Stege Marsh will remain intact and rise in elevation.

1 The sea level rise values used by BCDC are consistent with the State of California's Ocean Protection Council interim guidance (OPC, 2011). The guidance was targeted towards state agencies and non-state entities implementing projects or programs funded by the state or on state property. The Richmond Bay Campus LRDP applies the BCDC and OPC guidance of a 55" sea level rise by 2100 for development planning purposes.

2 All elevations are referenced to NGVD (National Geodetic Vertical Datum of 1929) unless indicated otherwise. NGVD elevation = NAVD (North American Vertical Datum of 1988) minus 2.8' at the RFS.

3 A 100-year event is defined as the flood that has a one percent chance of occurring in any year and is likely to occur or be exceeded in a 100-year period.

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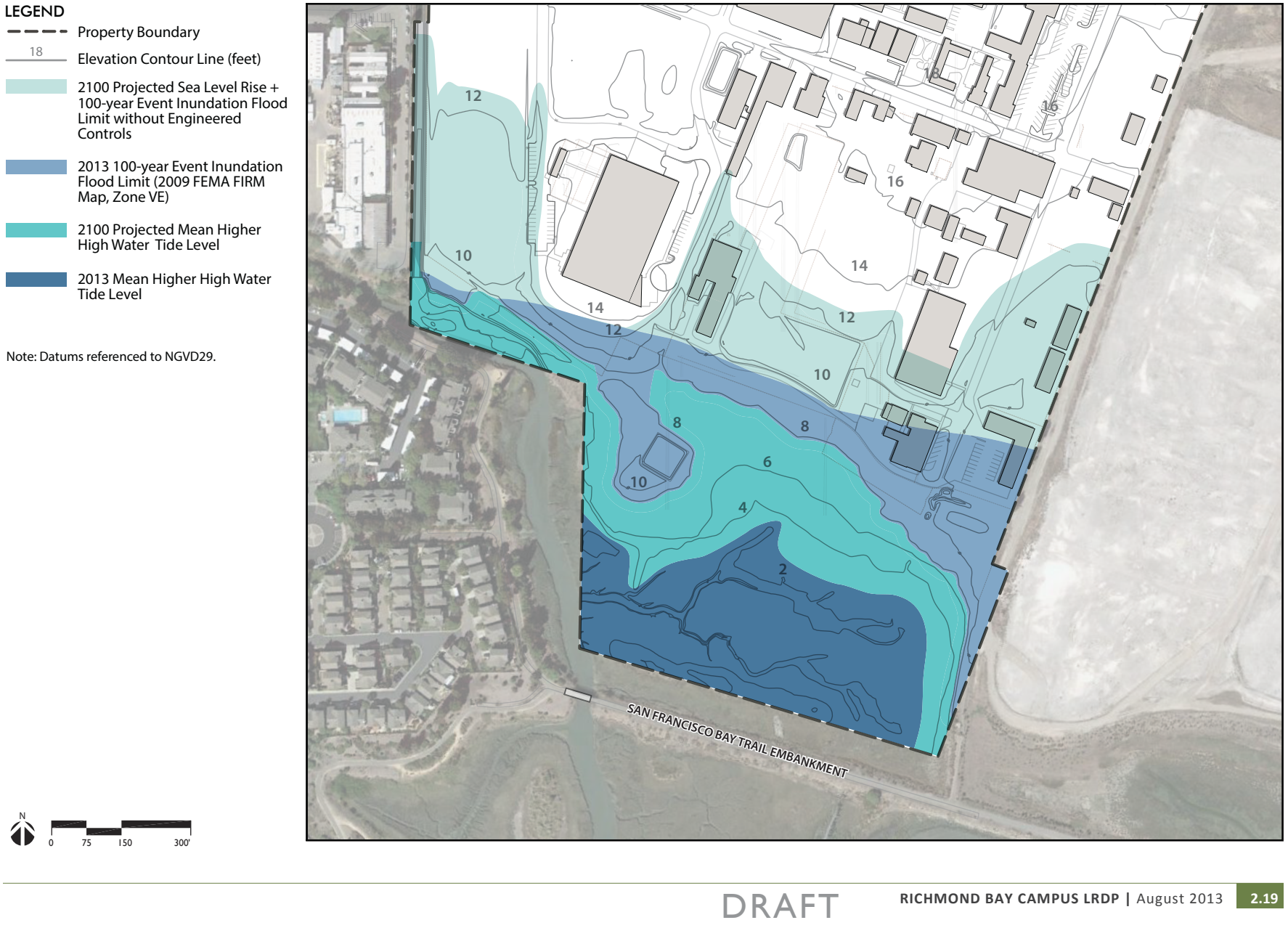
Figure 2.8: *Sea Level Rise*



SITE INFRASTRUCTURE

Roadways

The main entrance to the existing Richmond Field Station is located off of South 46th Street at Seaver Avenue (see Figure 2.9). The Field Station is fenced and features no other public entry points, although there are other locked gate locations for security, maintenance, and project uses. The Regatta property may be accessed from locations along Regatta Boulevard, some of which are fenced and secured by the tenant.

South 46th Street runs along the eastern boundary of the Richmond Bay Campus but is in poor condition and ends before it reaches the southern border of the site. Meade Street and Regatta Boulevard form the northern boundary of the Field Station. Regatta Boulevard also runs north-south through the site, and east-west at the southern end of the Regatta property boundary. The Meade Street bypass, built partially on the Richmond Bay Campus between Regatta Boulevard and Meade Street, routes traffic to the south of active railroad tracks. The bypass is expected to be in place until approximately 2022 before which time the Bradley Moody Underpass project is scheduled to provide an alternate route into and out of the Marina Bay area without crossing railroad tracks.

The road network within the Richmond Field Station is a remnant of a grid of roads on this and adjoining sites which was built during the site's industrial manufacturing history. Many roads lack curbs or gutters and there are few sidewalks on the site. Two internal north-south roadways – Egret Way and Owl Way – run parallel to the southern portion of South 46th Street. The east-west streets include Robin Drive in the north; Wren, Crow, and Lark Drives in the center; and Heron Drive at the southern end of the site. Today, vehicles are allowed to access nearly all parts of the site. Parking is distributed throughout the Field Station in small surface lots, generally adjoining buildings.

Utilities

The existing utilities services are provided by local utility companies and the City of Richmond. East Bay Municipal Utility District (EBMUD) provides water to the site; the Richmond Municipal Sewer District provides storm and sanitary sewer infrastructure; electrical power and natural gas are provided by Pacific Gas & Electric (PG&E); and AT&T is the telecommunications provider. In general, utility mains follow Regatta Boulevard, Meade Street, and South 46th Street. On the site, utility corridors run primarily in a north-south orientation along or parallel to existing road alignments including Egret Way and Lark Drive. On-site stormwater drainage flows north to south by way of open swales, culverts, and sheet flow into drains. Existing site utility infrastructure is sized to meet the current needs.

Many of the existing roads lack curbs, gutters and sidewalks.

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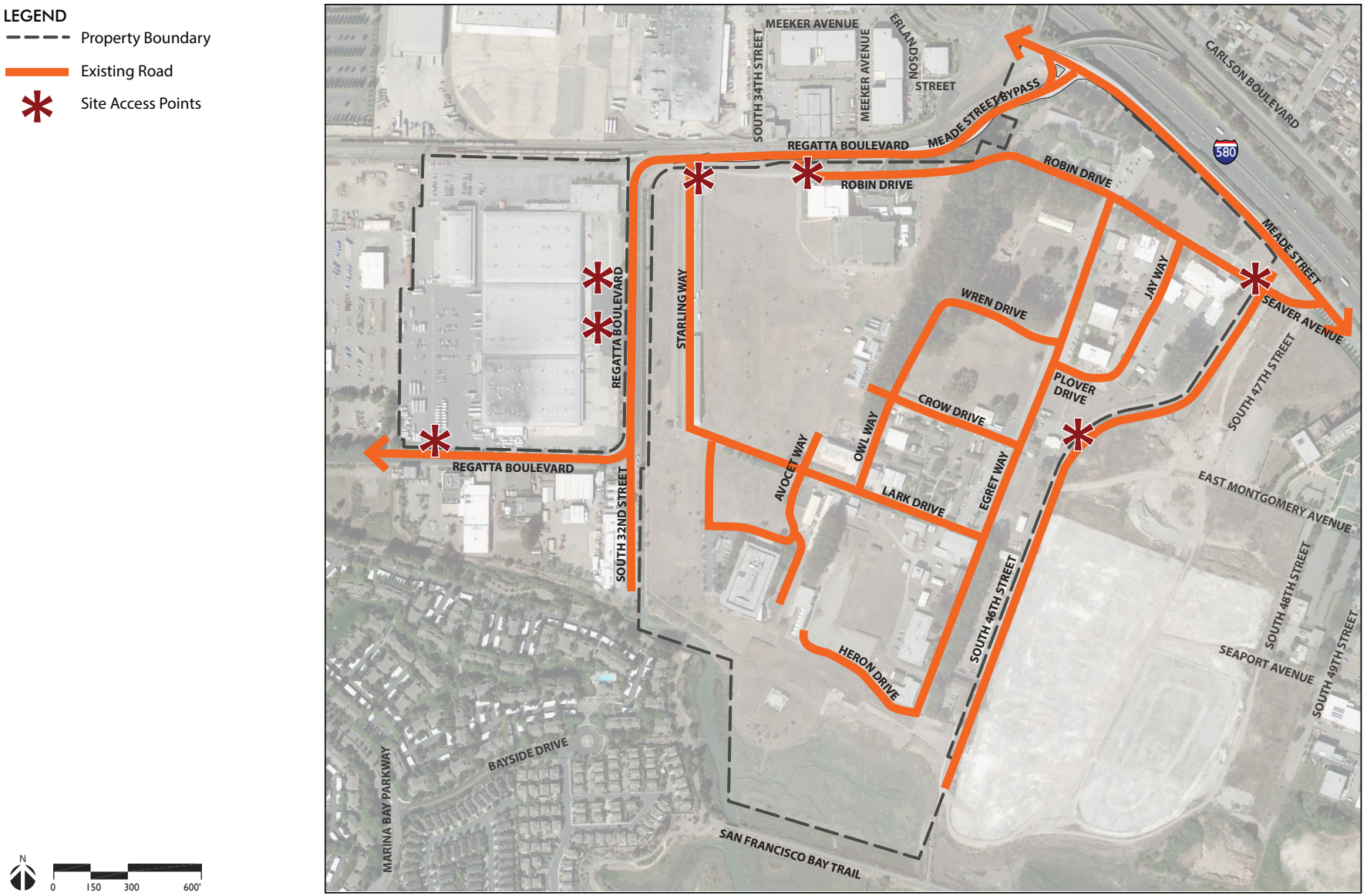
Figure 2.9: *Existing Road Network*



Placeholder for illustrative rendering to be included in the Final LRDP.