

HYDROLOGY AND WATER QUALITY

4.8 HYDROLOGY AND WATER QUALITY

This chapter discusses the regulatory framework, existing conditions, and impacts of the proposed Project related to hydrology and water quality.

4.8.1 ENVIRONMENTAL SETTING

4.8.1.1 REGULATORY FRAMEWORK

This section summarizes key federal, State, regional and local policies and regulations pertaining to hydrology and water quality that are applicable to the proposed Project.

Federal Regulations

Clean Water Act

The U.S. Environmental Protection Agency (EPA) is the lead federal agency responsible for water quality management. The Clean Water Act (codified at 33 U.S.C. Sections 1251-1376) of 1972 is the primary federal law that governs and authorizes water quality control activities by the EPA, as well as the states. Various elements of the Clean Water Act address water quality, and they are discussed below.

Permits to dredge or fill waters of the United States are administered by the U.S. Army Corps of Engineers (Army Corps) under Section 404 of the Clean Water Act. “Waters of the United States” are defined as all waters subject to the ebb and flow of the tide (which includes harbors), interstate waters, water impoundments, streams, rivers, and wetlands. The regulatory branch of the Army Corps is responsible for implementing and enforcing Section 404 of the Clean Water Act and issuing permits. Any activity that discharges fill material and/or requires excavation in waters of the United States must obtain a Section 404 permit. Before issuing the permit, the Army Corps requires that an analysis be conducted to demonstrate that the proposed project is the least environmentally damaging practicable alternative. Also, the Army Corps is required to comply with the National Environmental Protection Act (NEPA) before it may issue an individual Section 404 permit.

Under Section 401 of the Clean Water Act, every applicant for a Section 404 permit that may result in a discharge to a water body must first obtain State Water Quality Certification that the proposed activity will comply with State water quality standards. Certifications are issued in conjunction with Army Corps Section 404 permits for dredge and fill discharges. In addition, a Water Quality Certification must be sought for any activity that would result in the placement of structures in waters of the United States that are not jurisdictional to the Army Corps, such as isolated wetlands, to ensure that the proposed activity complies with State water quality standards. In California, the authority to either grant water quality certification or waive the requirement is delegated by the State Water Resources Control Board (SWRCB) to its nine Regional Water Quality Control Boards (RWQCBs).

Under federal law, the EPA has published water quality regulations under Volume 40 of the Code of Federal Regulations (40 CFR). Section 303 of the Clean Water Act requires states to adopt water quality standards for all surface waters of the United States. As defined by the Clean Water Act, water quality standards consist of two elements: (1) designated beneficial uses of the water body in question and (2)

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criteria that protect the designated uses. Section 304(a) requires the EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. In California, the EPA has designated the SWRCB and its RWQCBs with authority to identify beneficial uses and adopt applicable water quality objectives.

When water quality does not meet Clean Water Act standards and compromises designated beneficial uses of a receiving water body, Section 303(d) of the CWA requires that water body be identified and listed as “impaired”. Once a water body has been designated as impaired, a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive without exceeding applicable water quality standards, with a factor of safety included. Once established, the TMDL allocates the loads among current and future pollutant sources to the water body. In the vicinity of the Project site, Lower San Francisco Bay is listed as a Section 303(d) impaired water body.¹

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established by the Clean Water Act to regulate municipal and industrial discharges to surface waters of the United States, including discharges from municipal separate storm sewer systems (MS4s). Federal NPDES permit regulations have been established for broad categories of discharges, including point-source municipal waste discharges and nonpoint-source stormwater runoff. NPDES permits generally identify effluent and receiving water limits on allowable concentrations and/or mass emissions of pollutants contained in the discharge; prohibitions on discharges not specifically allowed under the permit; and provisions that describe required actions by the discharger, including industrial pretreatment, pollution prevention, self-monitoring and other activities.

Under the NPDES Program, all facilities which discharge pollutants into waters of the US are required to obtain an NPDES permit. Requirements for storm water discharges are also regulated under this program. In California, the NPDES permit program is administered by the SWRCB through the nine RWQCBs. The City of San Leandro lies within the jurisdiction of San Francisco RWQCB (Region 2) and is subject to the waste discharge requirements of the Municipal Regional Stormwater Permit (Order No. R2-2009-0074) and NPDES Permit No. CAS612008, as amended by Order No. R2-2011-0083 in 2011. The Alameda County permittees include Alameda County, the Alameda County Flood Control and Water Conservation District, and 14 cities, including San Leandro. The current Municipal Regional Stormwater Permit (MRP) will expire at the end of 2014 and a new permit is due to be reissued in 2015.

Under Provision C.3 of the MRP, the co-permittees use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent

¹ State Water Resources Control Board (SWRCB), 2010. *Final Integrated Report (CWA Section 303(d) List/305(b) Report*. http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/category5_report.shtml accessed August 1, 2014.

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increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques.

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains.² FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA. FEMA's minimum level of flood protection for new development is the 100-year flood event, also described as a flood that has a 1-in-100 chance of occurring in any given year.

Additionally, FEMA has developed requirements and procedures for evaluating earthen levee systems and mapping the areas affected by those systems.³ Levee systems are evaluated for their ability to provide protection from 100-year flood events and the results of this evaluation are documented in the FEMA Levee Inventory System (FLIS). Levee systems must meet minimum freeboard standards and must be maintained according to an officially adopted maintenance plan. Other FEMA levee system evaluation criteria include structural design and interior drainage.

Minimum NFIP floodplain management building requirements are applicable to some portions of the Project site per Title 44 Code of Federal Regulations, Sections 59 through 65. The portion of the project west of Monarch Bay Drive and just north of the existing boat launch is located in a Special Flood Hazard Zone VE, which is defined as a coastal flood zone where base flood wave heights are 3 feet or greater, or where other damaging base flood wave effects have been identified.⁴ The project areas east of Monarch Bay Drive are outside of the 100-year floodplain. As required by the FEMA regulations, all development constructed within the Special Flood Hazard Zone (as delineated on the FIRM) must be elevated so that the lowest floor is at or above the base flood elevation level. The term "development" is defined by FEMA as any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials. Per these regulations, if development in these areas occurs, a hydrologic and hydraulic analysis must be performed prior to the start of development, and must demonstrate that the development does not cause any rise in base flood elevation levels, as no rise is permitted within regulatory floodways. Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision, as soon as practicable, but not later than six months after such data becomes available.

FEMA is currently conducting a new coastal study called the California Coastal Analysis and Mapping Program (CCAMP) that will revise and update flood and wave data for San Francisco Bay and its estuaries.

² Federal Emergency Management Agency (FEMA), <http://www.fema.gov/hazard/flood/index.shtm>, accessed August 1, 2014.

³ Federal Emergency Management Agency (FEMA), 2003, Guidelines and Specifications for Flood Hazard Mapping Partners, <http://www.fema.gov/library/viewRecord.do?id=2206>, accessed August 1, 2014.

⁴ Federal Emergency Management Agency (FEMA), 2014. FEMA FIRM Panel Nos. 06001C0254G and 06001C0258G, dated August 3, 2009, <https://msc.fema.gov/portal/search?AddressQuery=San%20Leandro%2C%20CA>, accessed October 20, 2014.

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The analyses rely on a combination of hydrodynamic models and wave models to calculate elevated still water levels (SWELs), wave heights, and overland wave propagation that will be used to produce updated FIRM panels. These analyses along with local topographic data will be used to evaluate the location and extent of Special Flood Hazard Areas (SFHAs) and base flood elevations (BFEs). The preliminary maps will be produced in 2015.⁵ However, a preliminary map provided by FEMA shows the portion of the project south of Pescador Point Drive would be eliminated from the 100-year floodplain but the areas east of Monarch Bay Drive would be within the 100-year floodplain.⁶

Rivers and Harbors Act of 1899

Under the Rivers and Harbors Act of 1899, the Army Corps requires permits for activities involving the obstruction of the navigable capacity of any waters of the United States or the construction of any structures in or over navigable waters of the United States, including ports, canals, navigable rivers or other waters. “Navigable waters” under Section 10 of the Rivers and Harbors Act are defined as “those waters of the United States that are subject to the ebb and flow of the tide shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce.” Pursuant to Section 10 of the Rivers and Harbors Act, the Army Corps administers this regulatory program separate from the Section 404 program. A Section 10 permit may be required for structures or work outside the limits of navigable waters if the structure or work affects the course, location, condition, or capacity of the water body.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) provides the basic authority for the U.S. Fish and Wildlife Service (FWS) to evaluate impacts to fish and wildlife from proposed water resource development projects. This Act requires that all federal agencies consult with the FWS, the National Marine Fisheries Service, and State wildlife agencies (i.e., the California Department of Fish and Wildlife) for activities that affect, control, or modify waters of any stream or bodies of water. Under the Act, the FWS has responsibility for reviewing and commenting on all water resources projects. For example, the FWS would provide consultation to the Army Corps with regard to issuance of a Section 404 permit.

If a project may result in the “incidental take” of a listed species, an incidental take permit is required. An incidental take permit allows a developer to proceed with an activity that is legal in all other respects but that results in the “incidental taking” of a listed species. A Habitat Conservation Plan (HCP) must also accompany an application for an incidental take permit. The purpose of the HCP is to ensure that the effects of the permitted action on listed species are adequately minimized and mitigated.

⁵ Federal Emergency Management Agency (FEMA), 2014. *Northern Alameda County, California. San Francisco Bay Area Coastal Study*, March.

⁶ Email correspondence between FEMA, Alameda County, and the City of San Leandro in December 2013 and preliminary FIRM maps provided by FEMA.

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State Regulations

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Act (Water Code sections 13000 et seq.) is the basic water quality control law for California. The act established the SWRCB and divided the state into nine regional basins, each under the jurisdiction of a RWQCB. The SWRCB is the primary state agency responsible for the protection of California's water quality and groundwater supplies. The RWQCBs carry out the regulation, protection, and administration of water quality in each region. Each regional board is required to adopt a water quality control plan or basin plan that recognizes and reflects the regional differences in existing water quality, the beneficial uses of the region's ground and surface water, and local water quality conditions and problems. As described above, San Leandro is within the jurisdiction of the San Francisco Bay RWQCB (Region 2).

The Porter-Cologne Act also authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements (WDRs), NPDES permits, Section 401 water quality certifications, or other approvals. Other State agencies with jurisdiction over water quality regulation in California include the California Department of Health Services (DHS) for drinking water regulations, the California Department of Fish and Wildlife (CDFW) and the Office of Environmental Health and Hazard Assessment (OEHHA).

State Water Resources Control Board (SWRCB) General Construction Permit

In California, the SWRCB has broad authority over water quality control issues for the State. The SWRCB is responsible for developing statewide water quality policy and exercises the powers delegated to the State by the federal government under the CWA.

Construction activities that disturb one or more acres of land that could impact hydrologic resources must comply with the requirements of the SWRCB Construction General Permit (2009-0009-DWQ) as amended by 2010-0014-DWQ. Under the terms of the permit, applicants must file Permit Registration Documents (PRDs) with the SWRCB prior to the start of construction. The PRDs include a Notice of Intent (NOI), risk assessment, site map, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and a signed certification statement. The PRDs are now submitted electronically to the SWRCB via the Storm Water Multiple Application and Report Tracking System (SMARTS) website.

Applicants must also demonstrate conformance with applicable best management practices (BMPs) and prepare a Storm Water Pollution Prevention Plan (SWPPP), containing a site map that shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection, and discharge points, general topography both before and after construction, and drainage patterns across the project site. The SWPPP must list BMPs that would be implemented to prevent soil erosion and discharge of other construction-related pollutants that could contaminate nearby water resources. Additionally, the SWPPP must contain a visual monitoring program, a chemical monitoring program for nonvisible pollutants if there is a failure of the BMPs, and a sediment-monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Some sites also require implementation of a Rain Event Action Plan (REAP). The updated Construction General Permit (2010-0014-DWQ), effective on September 2, 2012 also requires applicants to comply with post-construction runoff reduction requirements.

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California Coastal Act of 1976

The California Coastal Act of 1976 established three designated coastal management agencies to plan and regulate the use of land and water in the coastal zone: the California Coastal Commission, the San Francisco Bay Conservation and Development Commission, and the California Coastal Conservancy. Under California's federally approved Coastal Management Program, the California Coastal Commission manages development along the California coast except for San Francisco Bay, while the San Francisco Bay Conservation and Development Commission oversees development. The mission of the California Coastal Conservancy is to purchase, protect, restore, and enhance coastal resources and provide shoreline access. Additional information on the San Francisco Bay Conservation and Development Commission, which has jurisdiction for projects in and around San Francisco Bay, is discussed in the Local Regulations section.

State Updated Model Water Efficient Landscape Ordinance (Assembly Bill 1881)

The updated Model Water Efficient Landscape Ordinance requires cities and counties to adopt landscape water conservation ordinances by January 31, 2010 or to adopt a different ordinance that is at least as effective in conserving water as the updated Model Water Efficient Landscape Ordinance (WELO). The City of San Leandro adopted the Bay-Friendly Landscape Ordinance in accordance with AB1881. The ordinance incorporates landscape protocols developed by the Alameda County Waste Management Authority (StopWaste) and all parameters in the WELO. The ordinance became effective as of February 1, 2010.

Local Regulations

San Francisco Bay Regional Water Quality Control Board

Regional authority for planning, permitting, and enforcement is delegated to the nine Regional Water Quality Control Boards (RWQCBs). The regional boards are required to formulate and adopt water quality control plans for all areas in the region and establish water quality objectives in the plans. San Leandro is within the jurisdiction of the San Francisco Bay RWQCB (Region 2).

The San Francisco Bay RWQCB addresses region-wide water quality issues through the creation of the Water Quality Control Plan for San Francisco Bay Basin (Basin Plan). The Basin Plan was updated most recently in June 2013. This Basin Plan designates beneficial uses of the State waters within Region 2, describes the water quality that must be maintained to support such uses, and provides programs, projects, and other actions necessary to achieve the standards established in the Basin Plan.⁷ The *Water Quality Control Policy for the Enclosed Bays and Estuaries of California*, as adopted by the SWRCB in 1995, also provides water quality principles and guidelines to prevent water quality degradation and protect the beneficial uses of waters of enclosed bays and estuaries.⁸

⁷ San Francisco Bay RWQCB, 2013. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*. Latest revision June 29, 2013.

⁸ State Water Resources Control Board, 1995. *Water Quality Control Policy for the Enclosed Bays and Estuaries of California, as Adopted by Resolution No. 95-84 on November 16, 1995*.

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Bay Protection and Toxic Cleanup Program

In 1989, the California legislature established the Bay Protection and Toxic Cleanup Program with the goal of protecting present and future beneficial uses of the Bay and estuarine waters of California. In addition, the program was tasked with identifying toxic hot spots (i.e., localized areas with elevated concentrations of pollutants) and developing prevention and control strategies to remediate the toxic hot spots. As part of this program in 1993, the San Francisco Bay RWQCB initiated the Regional Monitoring Program (RMP), which includes water quality monitoring near the Project site. The purpose of the program is to assess regional water quality conditions, characterize patterns and trends of contaminant concentrations and distribution in the water column, and identify general sources of contamination to San Francisco Bay. The program has established a database of water quality and sediment quality in the Bay, particularly with respect to trace elements and organic contaminants.

San Francisco Bay Conservation and Development Commission (BCDC)

The California Coastal commission carries out its mandate locally through the San Francisco Bay Area Conservation and Development Commission (BCDC). BCDC's jurisdiction for San Francisco Bay includes all sloughs, marshlands between mean high tide and five feet above mean sea levels, tidelands, submerged lands, and land within 100 feet of the Bay shoreline. The precise boundaries are determined by BCDC upon request. For planning purposes, BCDC assumes that projects have a lifespan of at least 50 to 90 years.⁹

Since the issuance of the Governor's Executive Order S-13-08 on November 2008, BCDC has followed other Natural Resource Agencies in planning for two sea level rise scenarios: 16 inches by mid-century and 55 inches by the end of the century. In April 2009, BCDC published its report with maps indicating zones that could be flooded due to sea level rise and that were based on existing elevations.¹⁰ In May 2011, BCDC published a revised draft of its proposed amendments to its master planning document, the *Bay Plan*. This received considerable public review and environmental review, and was adopted on October 6, 2011.^{11,12} These amendments include revised findings and policies to adapt to the effects of sea level rise.

As a permitting authority along the San Francisco Bay shoreline, BCDC is responsible for granting or denying permits for any proposed fill, extraction of materials, or change in the use of any water, land, or structure within BCDC's jurisdiction. Their jurisdiction extends from all tidally influenced portions of the site up to the Mean High Tide and then continuing up to 100-feet inland. Therefore, BCDC would have jurisdiction for most of the proposed project west of Monarch Bay Drive. A permit from BCDC is required

⁹ Bay Area Conservation and Development Commission (BCDC), 2011. *San Francisco Bay Plan*, http://www.bcdc.ca.gov/laws_plans/plans/sfbay_plan.shtml, accessed August 1, 2014.

¹⁰ Bay Area Conservation and Development Commission (BCDC), 2009. *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline*.

¹¹ Bay Area Conservation and Development Commission (BCDC), 2011. *Staff Report, Revised Preliminary Recommendation and Environmental Assessment for Proposed Bay Plan Amendment No. 1-08 Concerning Climate Change*. (For Commission consideration on September 1, 2011.)

¹² Bay Area Conservation and Development Commission (BCDC), 2011. Resolution No. 11-08. Adoption of Bay Plan Amendment No. 1-08 Adding New Climate Change Findings and Policies to the Bay Plan; And Revising the Bay Plan Tidal Marsh and Tidal Flats; Safety of Fills; Protection of the Shoreline; and Public Access Findings and Policies. Adopted October 6, 2011. Online at http://www.bcdc.ca.gov/proposed_bay_plan/10-01Resolution.pdf.

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for any Bay filling or dredging, which includes piers, pilings, and floating structures moored in the Bay for extended periods. A permit from BCDC would be required before proceeding with shoreline development. Permits may be granted or denied only after public hearings and after the process for review and comment by the City and County has been completed. BCDC will approve the permit if it is determined that the project is in accordance with defined standards for use of the shoreline, provisions for public access, and advisory review of appearance.

Projects in BCDC jurisdiction that involve Bay fill must be consistent with the Bay Plan policies on the safety of fills and shoreline protection. Land elevation changes caused by tectonic activity or consolidation/compaction of soft soils, such as Bay muds, is variable around the Bay. Consequently, some parts of the Bay may experience a greater relative rise in sea level than other areas. According to BCDC policies, new projects on fill or near the shoreline should either be set back from the edge of the shore so that the project will not be subject to dynamic wave energy, be built so the bottom floor level of structures will be above a 100-year flood elevation that takes future sea level rise into account for the expected life of the project, be specifically designed to tolerate periodic flooding, or employ other effective means of addressing the impacts of future sea level rise and storm activity.

Alameda County Flood Control & Water Conservation District

The Alameda County Flood Control and Water Conservation District (ACFCD) is a division of the Alameda County Public Works Agency that develops and maintains flood control systems for the public safety, health, and welfare of Alameda County residents and businesses.¹³ Additionally, the ACFCD enforces pollution control regulations governing County waterways.

The ACFCD is in the process of issuing a Hydrology and Hydraulics Manual that will outline the District's requirements for new developments and modification of existing flood control systems in western Alameda County. The ACFCD requires that primary drainage systems (between 50 acres and 10 square miles) be evaluated for two design storms. The system must convey the five-year storm when using the 100-year tide level of 7.6 feet above sea level (National Geodetic Vertical Datum [NGVD] 29) as an outlet constraint, and must convey the 100-year storm event when using the mean higher high water level of 4.4 feet above sea level (NGVD 29) as an outlet control constraint. In addition, all facilities that are part of the FEMA Flood Insurance Study must be designed to contain the FEMA 100-year storm using FEMA criteria. Where these facilities are subject to tidal backwater effects, two water surface profiles must be calculated and compared. The 100-year tide is run flat (no outflow from the channel), and the FEMA 100-year flow is run against a beginning water surface height of Mean Higher High Water. The higher of these two water surfaces controls the design. Secondary systems (drainage area less than 50 acres) are required to convey the 10-year storm event when using the higher water surface calculated for the two design storms.

Alameda County Clean Water Program (CWP)

Together with 13 other incorporated cities in Alameda County, San Leandro has joined with the Alameda County Flood Control & Water Conservation District, the Zone 7 Water Agency, and Alameda County in the

¹³ Alameda County Flood Control & Water Conservation District, About Us, <http://acffloodcontrol.org/about-the-district>, accessed August 1, 2014.

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Clean Water Program (CWP) initiative.¹⁴ Members of the program are regulated waste dischargers under the 2009 NPDES Permit issued by the San Francisco Bay RWQCB, and are responsible for municipal storm drain systems and watercourses that they own or operate. As part of the permitting process, dischargers must submit a Stormwater Management Plan that describes a framework for management of stormwater discharges during the term of the permit.

The City of San Leandro, as a co-permittee under the NPDES permit, is also subject to the Provision C.3 requirements for new development and redevelopment projects, and includes post-construction stormwater management requirements. Provision C.3 requirements are separate from, and in addition to, requirements for erosion and sediment control and for pollution prevention measures during construction. These requirements apply to all new development or redevelopment projects that create or replace 10,000 square feet of impervious surfaces and specific land use projects that create or replace 5,000 square feet of impervious surfaces (i.e., auto service facilities, retail gasoline outlets, restaurants, and/or uncovered surface parking). Project applicants are required to implement site design measures, source control measures, and stormwater treatment measures to reduce stormwater pollution during operation of the project. The permit specifies methods to calculate the required size of treatment devices.

Alameda County Watercourse Ordinance

The Alameda County Watercourse Ordinance is intended to prevent damage during flooding, control erosion and sedimentation, safeguard and preserve watercourses, and restrict the discharge of pollutants into watercourses. A watercourse is defined as any natural or man-made channel through which water flows continuously or intermittently. The ordinance controls development within and adjacent to watercourses by establishing 20-foot minimum setbacks for buildings from the top of the bank and provides the provisions for the issuance of watercourse permits. Implementation of this ordinance serves to protect surface water and groundwater from erosion, sedimentation, and sources of pollution.

San Leandro General Plan

The City of San Leandro General Plan, adopted in 2002 and updated in 2011, contains goals and policies that pertain to hydrology and water quality. The relevant goal and policies are listed in Table 4.8-1.

San Leandro Municipal Code

Four chapters of the City of San Leandro Municipal Code contain directives pertaining to hydrology and water quality issues, as explained in the following paragraphs:

- *Stormwater Management and Discharge Control – Chapter 3-15.* This chapter provides the storm water requirements for projects conducted within the City of San Leandro and is consistent with the requirements of the San Francisco RWQCB.

¹⁴ Alameda County, Stormwater Quality Control Requirements brochure, https://www.acgov.org/pwa/documents/brochure_9_05_final.pdf, accessed February 1, 2013.

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TABLE 4.8-1 SAN LEANDRO GENERAL PLAN GOAL AND POLICIES

Goal/Policy Number	Goal/Policy/Action Text
Chapter 6, Environmental Hazards	
Goal 29	Mitigation of Natural Hazards. Reduce the potential for injury, property damage and loss of life resulting from earthquakes, landslides, floods, and other natural disasters.
Policy 29.01	Risk Management. Minimize risks from geologic, seismic, and flood hazards by ensuring the appropriate location, site planning, and design of new development. The City's development review process, and its engineering and building standards, should ensure that new construction is designed to minimize the potential for damage.
Policy 29.06	Construction in the Flood Plain. Implement federal requirements relating to new construction in flood plain areas to ensure that future flood risks to life and property are minimized.
Action 29.06-A	FIRM Amendments. Continue to work with FEMA to amend and update Federal Insurance Rate Maps (FIRMs) so that they correctly depict flood hazards to the City. Continue the City's elevation verification program to assist homeowners in determining their flood zone designation and to further refine the flood plain boundaries.
Policy 29.07	Reducing Flood Hazards. Work collaboratively with County, State, and federal agencies to develop short- and long-term programs that reduce flood hazards in the City. At the local level, the City will regularly maintain its storm drain system and ensure that those portions of San Leandro Creek under its jurisdiction remain clear of obstructions.
Action 29.07-A	Coordination with ACFCWD. Improve coordination with the Alameda County Flood and Water Conservation District to ensure that flood channels are regularly cleaned and maintained.
Goal 32	Water Quality. Maintain and improve water quality in San Leandro's creeks, wetlands, and offshore waters.
Policy 32.01	Urban Runoff Control. Continue to implement water pollution control measures aimed at reducing pollution from urban runoff. These measures should emphasize best management practices by residents, businesses, contractors, and public agencies to ensure that surface water quality is maintained at levels that meet state and federal standards.
Action 32.01-A	Stormwater Pollution Prevention Plans. As required by state and federal law, require Stormwater Pollution Prevention Plans for qualifying projects and ensure that such projects include appropriate measures to minimize the potential for water pollution.
Policy 32.02	Clean Water Education. Promote the public information and participation provisions of the Alameda Countywide Clean Water Program.
Action 32.02-A	Clean Water Program Educational Components. Continue to implement programs in coordination with the Alameda County Clean Water Program to better educate the public on urban runoff hazards. Examples of these programs include storm drain stenciling, preparation of brochures and posters, website information, and television and newspaper advertising. Use these programs to increase awareness of clean water laws and the penalties associated with illicit discharges.
Policy 32.03	Interagency Coordination. Coordinate water quality planning, regulation, and monitoring with other public agencies that are involved in water resource management. Establish partnerships and task forces with these agencies and with nearby cities as needed to develop programs addressing issues that cross jurisdictional lines.
Action 32.03-A	NPDES Permit Revisions. Remain an active participant in discussions of possible revisions to state and federal clean water legislation, including revisions to the Alameda County NPDES stormwater permit.
Policy 32.04	Water Quality Monitoring. As required by federal, State, and regional programs, conduct monitoring of water quality in San Leandro waterways to evaluate the progress of local clean water programs and identify the necessary steps for improvement.
Action 32.04-A	Water Quality Monitoring Programs. Continue water quality monitoring programs in San Leandro waterways.
Policy 32.05	Public Works Maintenance. Implement City Public Works maintenance activities, including scheduled street sweeping and cleaning of storm drains and culverts, to minimize pollution from surface runoff.

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TABLE 4.8-1 SAN LEANDRO GENERAL PLAN GOAL AND POLICIES

Goal/Policy Number	Goal/Policy/Action Text
Action 32.05-A	Community Cleanups. Coordinate with community groups to develop clean-up programs for the shoreline, creeks, and flood control channels to remove debris and litter and minimize the potential for surface water pollution.
Action 32.05-B	Street Sweeping Improvements. Improve the effectiveness of the City’s street sweeping program through measures such as 1) more aggressive ticketing or towing of illegally parked cars (by the San Leandro Police Department, 2) more frequent scheduling of street sweeping, 3) better coordination with trash collection so that sweeping is not hampered by curbside trash containers and recycling bins, 4) installation of “no parking on street sweeping days” signs, and 5) increased public education about the program and the water quality benefits it provides.
Policy 32.06	Illicit Discharges. Control illicit discharges into the City’s stormwater system through inspections, compliance evaluation, enforcement programs, and tracking activities.
Policy 32.07	Pre-Treatment Requirements. Maintain and enforce pre-treatment requirements for industries as needed to minimize the discharge of potentially toxic materials into the City’s sanitary sewer system.
Policy 32.08	Hazardous Spill Response. Maintain and update hazardous spill response and cleanup programs that minimize the potential impacts of toxic spills on water quality.
Policy 32.09	Nearshore Waters. Ensure the continued improvement of nearshore waters through the regulation of water pollution sources within and around the San Leandro Marina, including boats and live-aboards.
Policy 32.10	Groundwater Protection. Protect San Leandro’s groundwater from the potentially adverse effects of urban uses. Future land uses should be managed to reduce public exposure to groundwater hazards and minimize the risk of future hazards.
Action 32.10-A	Groundwater Monitoring. Encourage continued monitoring of local groundwater by State regulatory agencies and take steps to prevent further contamination.
Policy 32.11	Impervious Surfaces. Encourage the use of porous pavement and other practices to reduce impervious surfaces and the amount of stormwater runoff from parking lots and driveways.
Chapter 8, Community Services and Facilities	
Goal 52	Infrastructure. Ensure that local water, sewer, storm drainage, and solid waste facilities are well maintained; improvements meet existing and future needs; and land use decisions are contingent on the adequacy and maintenance of such facilities.
Policy 52.01	Development Impacts. Permit new development only when infrastructure and utilities can be provided to that development without diminishing the quality of service provided to the rest of the City.
Policy 52.02	Fair Share Costs. Require future development to pay its fair share of the cost of improving the water, sewer, drainage, and other infrastructure systems needed to serve that development. Use fees and other appropriate forms of mitigation to cover the costs of upgrading public infrastructure.
Policy 52.03	Coordination. Coordinate local infrastructure planning with Alameda County Flood Control and Water Conservation District (ACFCD) to ensure that infrastructure remains adequate to serve existing and planned development.
Policy 52.06	Drainage. Require drainage improvements for new development which ensure that stormwater runoff is adequately handled both on-site and off-site and which implement state and federal clean water requirements.
Policy 52.07	Maintenance. Ensure that sufficient funding is provided for the ongoing maintenance of City-owned facilities, including streets, street lights, traffic signals, landscaping, street trees, storm drains, public buildings and other infrastructure.

Source: San Leandro General Plan, 2011.

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- *Bay-Friendly Landscaping Requirements for City Projects – Chapter 3-22.* The City of San Leandro has also adopted a Water Efficiency Landscape Ordinance in coordination with StopWaste that exceeds the State’s model ordinance in terms of water savings.
- *Floodplain Management – Chapter 7-9.* The ordinance is designed to protect human life and health, minimize expenditures for costly flood control projects, minimize the need for rescue and relief efforts, business interruptions, and damage to public facilities and utilities. The ordinance also ensures that property owners construct new and substantially improved buildings in the 100-year floodplain in accordance with the National Flood Insurance Program’s goals to protect life and property.
- *Grading, Excavations, and Fill – Chapter 7-12.* This requires projects to prepare erosion control and sedimentation control plans and drainage plans to the City Engineer for approval prior to the start of project construction. The plans will ensure that storm water from the site meets the quality standards dictated by Chapter 3-15, *Stormwater Management and Discharge Control*. The erosion and sediment control plans must be prepared in accordance with the most current “Association of Bay Area Governments (ABAG) Manual of Standards for Erosion and Sediment Control Measures” and the “Handbook for Erosion and Sediment Control.”

4.8.1.2 EXISTING CONDITIONS

Regional Hydrology

The Project is located in the San Francisco Bay Hydrologic Region, which covers approximately 4,500 square miles and encompasses 10 counties, including Alameda County.¹⁵ It corresponds with the boundaries of the San Francisco Regional Water Quality Control Board (RWQCB) Region 2 and the San Francisco Bay Area Integrated Regional Water Management (IRWM) Plan. The San Francisco Bay Hydrologic Region is a complex network of watersheds, marshes, rivers, creeks, reservoirs, and bays mostly draining into the San Francisco Bay and the Pacific Ocean.

The Project is located within the San Leandro Marina Watershed.¹⁶ Runoff within the watershed is collected through a system of underground culverts, storm drains, and engineered channels that discharge into San Francisco Bay. The Estudillo Canal Watershed is located just south of the Project site and runoff from this watershed drains into the Estudillo Canal, which ultimately discharges into San Francisco Bay. The creeks, drainage channels, and watersheds in the vicinity of the Project site are shown on Figure 4.8-1.

¹⁵ California Department of Water Resources, *California Water Plan, Update 2009, San Francisco Bay, Integrated Water Management. Bulletin 160-09, Volume 3, Regional Reports.*

¹⁶ Oakland Museum of California, Guide to San Francisco Bay Area Creeks, http://museumca.org/creeks/WholeMaps/2_Hayward%20Creek%20Map.pdf, accessed August 6, 2014.



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Source: Oakland Museum, Guide to East Creeks, 1996.






-  Watershed divide
-  Creek in natural channel
-  Engineered channel
-  Buried storm drain or culvert greater than 24"
-  Direction of flow

Figure 4.8-1
Creeks, Drainage Ways and Watersheds

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Alameda County is also divided into nine flood control zones by the Alameda County Flood Control and Water Conservation District (ACFCD); the Project site and parts of San Leandro are located within Zone 9.¹⁷ Zone 9 covers 2,482 acres and includes 14 miles of underground storm drain pipes, two miles of concrete channels, one mile of earthen channels, and less than one mile of natural and improved creeks.¹⁸ The construction, monitoring, and maintenance of the stormwater infrastructure are a joint effort between ACFCD and the San Leandro Public Works Department. The ACFCD is currently working with FEMA to identify and map coastal hazards that take into account 100-year tides, climate change, and sea level rise and provide input for the updated FIRM panels, which will delineate SFHAs and BFEs.¹⁹ The study is expected to be completed by July 2016.

Local Drainage

The City of San Leandro Department of Public Works owns and maintains 175 miles of storm drain conduits throughout the City. The City's storm drain system feeds into a larger system owned and operated by the ACFCD. This system includes the lower reaches of San Leandro and San Lorenzo Creeks, as well as a number of channels extending into San Leandro neighborhoods west of Interstate 880. The District's drainage facilities include levees, pump stations, erosion control devices, and culverts. The ACFCD maintains these facilities, including fence repair, vegetation removal, preventive maintenance of pump stations, spill prevention and cleanup, and investigation of inquiries and clean water concerns.

The City of San Leandro storm drains are maintained by the Department of Public Works. Catch basins and conduits are cleaned annually. Debris is removed from the tops of the storm drain inlets and the inside of the basins are cleaned. Prior to winter rains, City crews inspect problem flood areas and clear debris to minimize storm drain blockages. Major development proposals are reviewed to assess drainage impacts and determine appropriate mitigation measures. If appropriate, the City may require stormwater detention ponds or improvements to the City's storm drain system to ensure that runoff from new development does not degrade local creeks. These measures are related to the C.3 provisions of the Alameda County Clean Water Program.²⁰

Marina and Shoreline

Existing stormwater runoff from the two peninsulas that encircle the boat harbor is generally via sheet flow that is directed to City-maintained catch basins that discharge directly into San Francisco Bay. In the area along Mulford Point Drive near the El Torito restaurant, stormwater is also directed to catch basins that discharge into San Francisco Bay through several outfall structures.

There are two existing underground storm drain systems in the vicinity of the Marina Inn and Horatio's Restaurant that drain into the pond at the Marina Golf Course. The system in the vicinity of Horatio's

¹⁷ Alameda County Flood Control & Water Conservation District, *Report to the Community, Fiscal Years 2008 and 2009*. <http://acffloodcontrol.org/files/pdfs/acfcd2012-13report.pdf>, accessed August 6.

¹⁸ Alameda County Flood Control & Water Conservation District, 2014. *Flood Control Zone 9*, <http://acffloodcontrol.org/floodplain-management/neighborhood-zones/zone-9>, accessed August 6, 2014.

¹⁹ Alameda County Public Works Agency, 2014. *Modification No. 3 to the Agreement with DHI Water & Environment, Inc. to Perform Specialized Coastal Hazard Analysis and Mapping of Select Shoreline Areas of Alameda County*.

²⁰ Alameda County Clean Water Program, 2014. *Development Related Issues*, <http://www.cleanwaterprogram.org/business/development.html>, accessed September 2, 2014.

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Restaurant drains to the pond via an 18-inch storm drainpipe under Monarch Bay Drive, and the Marina Inn system drains to the pond via a 15-inch storm drainpipe under Monarch Bay Drive.²¹

Golf Course

Surface runoff from the Marina Golf Course drains into a pond located in the center of the golf course. The pond is used for irrigation of the golf course. The water in the pond is recharged by stormwater during wet months and supplemented by reclaimed water from the City's Water Pollution Control Plant during dry months. Excess stormwater during large storms is pumped to another pond located at the south end of the Tony Lema Golf Course, located south of the Marina Golf Course.

Upland Areas

The City of San Leandro and Alameda County's storm drain systems have several outfalls into San Francisco Bay near the Project site. One 36-inch outfall is located at the west end of Marina Boulevard. This structure receives stormwater from two storm drain systems. A 30-inch County storm drain located beneath Marina Boulevard collects runoff from Marina Boulevard and adjacent residential areas and discharges the runoff to the 36-inch outfall. Another 27-inch City storm drain is located along the east side of the Marina Golf Course and collects stormwater from West Avenue 133rd and West Avenue 134th. Due to the low elevations of these drainage areas, this system consists of a storm drain pump station located at the intersection of Monarch Bay Drive and Marina Boulevard.²²

The other storm drain system has a 60-inch storm drain outfall that discharges into San Francisco Bay at the end of Fairway Drive. The outfall connects to a 42-inch County storm drain pipe that extends up Fairway Drive and drains a large area east and northeast of the Project site. Drainage from several 12-inch City storm drains beneath Marina Park and Tony Lema Golf Course also connect to this outfall. Due to the low elevations of the drainage area, this system consists of a storm drain pump station located on Fairway Drive approximately 650 feet east of Monarch Bay Drive.²³

There also are five outfalls along Mulford Point Drive that direct runoff from the road and parking lots into San Leandro Marina and one outfall west of Monarch Bay Drive that directs runoff from the parking lot into San Francisco Bay.²⁴

Water Quality

Surface water quality is affected by point source and non-point source pollutants. Point source pollutants are those emitted at a specific point, such as a pipe, while non-point source pollutants are typically generated by surface runoff from diffuse sources, such as streets, paved areas, and landscaped areas. Non-point source pollutants are more difficult to monitor and control, although they are important contributors to surface water quality in urban areas.

²¹ City of San Leandro, Department of Public Works, 1968. Marina Storm Drainage, Map No. 440-C-1506.

²² City of San Leandro, Department of Public Works, 1968. Marina Storm Drainage, Map No. 440-C-1506.

²³ City of San Leandro, Department of Public Works, 1968. Fairway Storm Drainage, Map No. 440-C-1512.

²⁴ City of San Leandro, GIS, 2013. Storm Map printed on June 27, 2013.

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Stormwater runoff pollutants vary with land use, topography, and the amount of impervious surface, as well as the amount and frequency of rainfall and irrigation practices. Runoff in developed areas typically contain oil, grease, litter, and metals accumulated in streets, driveways, parking lots, and rooftops, as well as pesticides, herbicides, particulate matter, nutrients, animal waste, and other oxygen-demanding substances from landscaped areas. The highest pollutant concentrations usually occur at the beginning of the wet season during the “first flush.”

All stormwater runoff from various portions of the proposed Project would discharge into San Francisco Bay. The San Francisco Bay RWQCB monitors surface water quality through implementation of the Water Quality Control Plan (Basin Plan) and designates beneficial uses for surface water bodies and groundwater. The beneficial uses for San Francisco Bay include industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, water non-contact recreation, and navigation.²⁵

In addition to the establishment of beneficial uses and water quality objectives, another approach to improve water quality is a watershed-based methodology that focuses on all potential pollution sources and not just those associated with point sources. If a body of water does not meet established water quality standards under traditional point source controls, then it is listed as an impaired water body under Section 303(d) of the Clean Water Act. For 303(d) listed water bodies, a limit is established, which defines the maximum amount of pollutants (or Total Maximum Daily Load – TMDL) that can be received by that water body. South San Francisco Bay is listed as an impaired water body near the Project site and stormwater runoff from the project would discharge into this water body. The list of 303(d) pollutants in San Francisco Bay and the status of TMDL implementation are provided in Table 4.8-2.

As discussed previously, the San Francisco Bay RWQCB has initiated the Regional Monitoring Program to assess water quality conditions in the Bay and has established a database of water quality sampling results. The nearest monitoring station (CB022W) is approximately 1.5 miles east of the Project site. The most recent water quality sampling was conducted in 2007, which carried out analysis for conventional water quality parameters (conductivity, dissolved oxygen, hardness, nitrates, pH, salinity, and suspended solids, among others), trace elements (including mercury and methylmercury), trace organics (including polyaromatic hydrocarbons [PAHs], polychlorinated biphenyls [PCBs], phthalates, polybrominated diphenyl ethers, and pesticides), and toxicity. The results indicated that water quality conditions at these locations were well within the water quality objectives established by the RWQCB for the monitored parameters.

Groundwater

Given the Project site’s close proximity to the Bay tidal waters, groundwater aquifers beneath the Project site are shallow, and tidally influenced in elevation and water quality. Deep aquifers are also present.

²⁵ San Francisco Regional Water Quality Control Board (RWQCB), 2013. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*.

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TABLE 4.8-2 SECTION 303(D) LIST OF IMPAIRED WATER BODIES IN VICINITY OF PROJECT SITE

Water Body	Pollutant	Potential Source	Status of TMDL
South San Francisco Bay	Chlordane	Nonpoint source	Planned (2013)
	DDT	Nonpoint source	Planned (2013)
	Dieldrin	Nonpoint source	Planned (2013)
	Dioxin compounds	Atmospheric deposition	Planned (2019)
	Furan compounds	Atmospheric deposition	Planned (2019)
	Invasive species	Ballast water	Planned (2019)
	Furan compounds	Atmospheric deposition	Planned (2019)
	Mercury	Industrial and municipal point sources; resource extraction; atmospheric deposition; natural sources; nonpoint sources	Approved (2008)
	PCBs	Unknown nonpoint sources	Approved (2010)
	Trash	Illegal dumping; urban runoff/storm sewers	Planned (2021)

Source: State Water Resources Control Board. *2010 Integrated Report, Clean Water Act, Section 303(d) List*, Accessed on August 6, 2014, http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml.

The Project site is located within the East Bay Plain subbasin of the Santa Clara Valley Groundwater Basin.²⁶ The East Bay Plain sub-basin is bounded on the north by San Pablo Bay, on the east by Franciscan Basement rock, and on the south by the Niles Cone Groundwater Basin. It extends beneath San Francisco Bay to the west. Numerous creeks including San Leandro Creek, flow from the western slope of the Diablo Range westward across the plain into San Francisco Bay. The shallow aquifer is close to the surface near the Project site, approximately 5 feet below ground surface (bgs). Shallow groundwater in San Leandro generally flows to the west. The deep aquifer is located approximately 250 feet or more bgs.

There are approximately 900 registered groundwater wells in San Leandro.²⁷ Most are used for industrial purposes or water quality monitoring; however, there are several wells on residential properties that are used for irrigation purposes. The ACFCD has jurisdiction for the installation, construction, and monitoring of these groundwater wells and maintains records at their offices. Domestic use of groundwater wells in San Leandro is currently not permitted due to contamination by volatile organic compounds (VOCs), gasoline, and heavy metals. There are four major groundwater plumes in San Leandro that are now undergoing site characterization and/or remediation. The nearest plume to the Project site, known as the San Leandro Plume, is approximately one mile east of the Project area.²⁸ Additional information on the plumes can be found in Chapter 4.7, *Hazards and Hazardous Materials*, of this Draft EIR.

²⁶ California Department of Water Resources, *California's Groundwater: Bulletin 118*, http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/2-9.01.pdf, accessed August 6, 2014.

²⁷ City of San Leandro, 2011. *San Leandro General Plan Update, Draft Environmental Impact Report. Water Quality*.

²⁸ ESA, 2007. *San Leandro Marina Opportunities and Constraints Analysis*, November.

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Flooding

FEMA determines floodplain zones in an effort to assist cities in mitigating flooding hazards through land use planning. FEMA also outlines specific regulations for any construction within a 100-year floodplain. The 100-year floodplain is defined as an area that has a one percent chance of being inundated during a 12-month period. FEMA also prepares maps for 500-year floods, which mean that in any given year, the risk of flooding in the designated area is 0.2 percent.

In some locations, FEMA also provides measurements of base flood elevations for the 100-year flood, which is the minimum height of the flood waters during a 100-year event. Base flood elevation is reported in feet above sea level. Depth of flooding is determined by subtracting the land's height above sea level from the base flood elevation. Areas within the 100-year flood hazard area that are financed by Federally-backed mortgages are subject to mandatory federal insurance requirements and building standards to reduce flood damage.

According to FEMA Flood Insurance Rate Map (FIRM) Nos. 06001C0254G and 06001C0258G dated August 3, 2009, a small portion of the Project site is within the 100-year floodplain (Zone VE). A map of the Project Area and the 100-year and 500-year floodplains is shown on Figure 4.8-2. The 100-year flood zone is also known as a Special Flood Hazard Area (SFHA); homeowners with mortgages within the SFHA are required to be protected by flood insurance. Zone VE is defined as a coastal high hazard area, which extends offshore to the inland limit that is subject to high-velocity wave action. The boundary of Zone VE is generally based on wave heights (3 feet or greater) or wave run-up depths (3 feet or greater).

The area south of Pescador Point Drive is the only portion of the Project within the 100-year floodplain of SFHA. The rest of the Project, including the peninsulas that encircle the boat harbor and the landside portions of the Project on the Marina Golf Course are either in the 500-year floodplain or in Zone X (minimal risk hazard), where flood insurance is not required.

FEMA is performing detailed coastal engineering analyses and mapping of the San Francisco Bay shoreline within nine adjoining counties, including Alameda County.²⁹ The analyses and mapping will revise and update flood and wave data for the Alameda County Flood Insurance Study report and will result in updated FIRM panels, revised SFHAs, and Base Flood Elevations (BFEs). Preliminary FIRMs have been developed for San Leandro that include the project site, as shown on Figure 4.8-3. The preliminary FIRM shows that the area south of Pescador Point Drive would be outside of the 100-year flood zone but the areas of the project site east of Monarch Bay Drive would be within the 100-year floodplain. This is due to inadequate height of the levee on the north bank of San Leandro Creek that could cause flooding to properties north of the creek during severe weather events.

²⁹ Federal Emergency Management Agency (FEMA), 2014. *Region IX National Flood Insurance Program, Risk Mapping, Assessment, and Planning, San Francisco Bay Area Coastal Study, Alameda, California*. Website <http://www.r9map.org/Pages/ProjectDetailsPage.aspx?choLoco=1&choProj=183>, accessed November 3, 2014.



100-year Floodplain



500-year Floodplain



Project Boundary

Figure 4.8-2
Floodplains



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Source: Esri, HERE, DeLorme, Intermap, TomTom, USGS, METI/NASA, USDA, EPA | FEMA.



Project Site

Figure 4.8-3
Preliminary Flood Insurance Rate Map

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The Alameda County Public Works Agency and the City of San Leandro are working together on actions that will remove approximately 1,000 properties in the City from the 100-year floodplain designation, as shown in the preliminary revised FIRMs.³⁰ Actions taken by San Leandro would include increasing the elevation at the end of Davis Street to prevent flooding and meeting with the owners of Mission Bay mobile home park regarding strengthening and completing the wall on the west side of the property line adjacent to the rail line in order to remove their properties from the floodplain.

Actions taken by Alameda County would include repairing the gates and addressing the elevation of banks at Estudillo Canal from Monarch Bay Drive Bridge to Wicks Boulevard. The gate repair and elevation work would be designed to protect the Marina Faire neighborhood from flooding. Also, there are plans to acquire the right-of-way along the western property line of the low lying properties on Neptune Drive just north of Marina Boulevard and elevate the embankment of the low lying properties using material from the Estudillo Canal project to prevent flooding in the Mulford Gardens neighborhood. If these actions are approved by FEMA and the preliminary FIRMs are revised, there should be no portions of the proposed project within the 100-year floodplain.

Sea Level Rise

California Executive Order S-13-2008 states that all State agencies planning construction projects in areas vulnerable to sea level rise must consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and to the extent feasible, reduce expected risks to sea level rise.³¹ The Governor of California's Delta Vision Blue Ribbon Task Force adopted a sea level rise of 55 inches by 2100 for planning purposes. The San Francisco Bay Conservation and Development Commission (BCDC) in the latest amendment to the Bay Plan (October 2011), added new climate change findings and policies. The previous policy language recommended that new development not be approved in low-lying areas that are in danger of flooding now or in the future unless the development was elevated above possible flood levels. The new amended policies allow protection from flooding, encourage innovative means of dealing with flood danger, and make it clear that local governments will determine how best to deal with development proposals inland of BCDC's jurisdiction. The BCDC has jurisdiction to regulate new development within 100 feet inland from the Bay shoreline. This would apply to waterside portions of the Project west of Monarch Bay Drive. Local government retains its authority over development more than 100 feet inland from the Bay shoreline and the provisions of the Bay Plan do not apply outside BCDC's jurisdiction for purposes of implementing CEQA.³³

The BCDC new policies also require sea level rise risk assessments to be conducted when planning shoreline areas or designing large shoreline projects within BCDC jurisdiction. The risk assessment should be prepared by a qualified engineer and should be based on the estimated 100-year flood elevation that takes into account the best estimates of future sea level rise and current and planned flood protection. A range of sea level projections for mid-century and end of century should be used in the risk assessment

³⁰ City of San Leandro, 2014. Letter from Jerome Smith, Chief Building Official/Flood Plain Administrator to Daniel Woldensenbet, Public Works Director, Alameda County Public Works Agency dated November 6, 2014.

³¹ State of California. *Executive Order S-13-08*, <http://gov.ca.gov/news.php?id=11036>, accessed October 14, 2014.

³³ San Francisco Bay Conservation and Development Commission (BCDC). *Resolution No. 11-08: Adoption of Bay Plan Amendment Adding New Climate Change Findings and Policies to the Bay Plan*, http://www.bcdc.ca.gov/proposed_bay_plan/10-01Resolution.pdf, accessed October 14, 2014.

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and inundation maps should be prepared. The risk assessment should identify all types of potential flooding, degrees of uncertainty, consequences of defense failures, and risks to existing habitat from proposed flood protection devices. All projects should be designed to be resilient to a mid-century sea level rise projection. If it is likely that the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long-term impacts that will arise, based on the risk assessment. Shoreline protection projects, such as levees and seawalls, must be designed to withstand the effects of projected sea level rise and to be integrated with adjacent shoreline protection. Whenever feasible, projects must integrate hard shoreline protection structures with natural features, such as marsh or upland vegetation, that enhance the Bay ecosystem.³⁵

Different scenarios and models used to predict sea level rise result in different estimates in the magnitude of sea level rise. Most shoreline damage from flooding will occur as a result of storm activity in combination with higher sea levels. The key factors that contribute to coastal flooding include high tides, storm surge, high waves, and high runoff rates from rivers and creeks.³⁶

The Association of Bay Area Governments (ABAG) has produced a sea level rise scenario map for long range planning.³⁷ Figure 4.8-4 shows the projected sea level rise for the project site. The area is vulnerable to a projected sea level rise of 55 inches.

Dam Inundation

Dam failure is the uncontrolled release of impounded water behind a dam. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, and terrorism can all cause a dam to fail.³⁸ Dam failure can occur with little warning. Intense storms may produce floods in a few hours or even minutes for upstream locations and dam failure may occur within hours of the first signs of breaching. Other failures and breaches can take much longer to occur, from days to weeks. However, dam failure is a very rare occurrence. There is no historic record of dam failure in Alameda County or San Leandro.³⁹

The California Office of Emergency Services (CalOES), formally known as California Emergency Management Agency (CalEMA), is required by State law to work with State and federal agencies, dam owners and operators, municipalities, floodplain managers, planners, and the public to make available dam inundation maps.⁴⁰

³⁵ San Francisco Bay Conservation and Development Commission (BCDC), 2014. *New Sea Level Rise Policies Fact Sheet*, http://www.bcdc.ca.gov/planning/climate_change/SLRfactSheet.shtml, accessed October 15, 2014.

³⁶ San Francisco Bay Conservation and Development (BCDC). *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline*, October 6, 2011.

³⁷ Association of Bay Area Governments (ABAG). *Sea Level Rise Scenario Map for Long Range Planning*, <http://quake.abag.ca.gov/searise/>, accessed April 5, 2014.

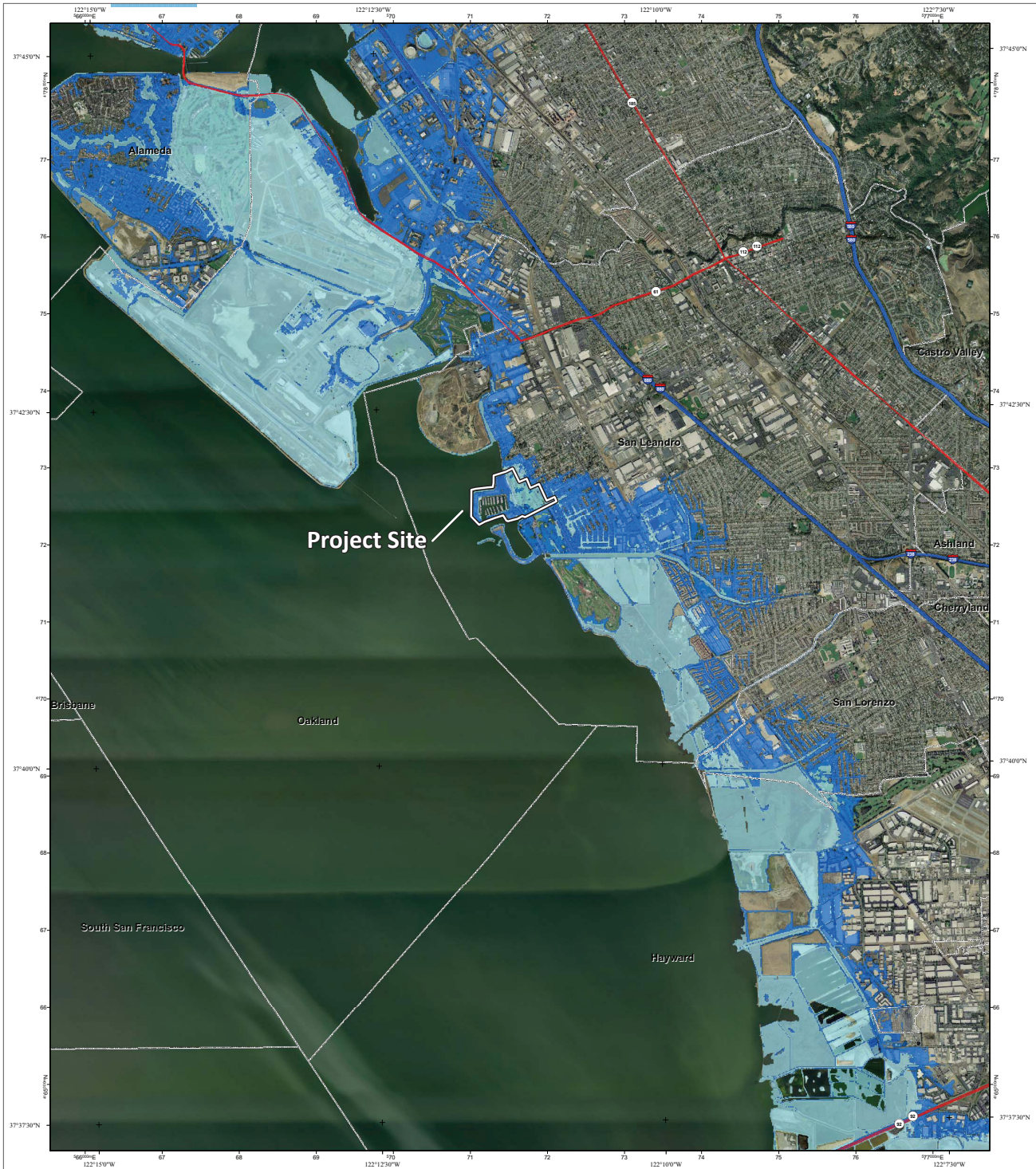
³⁸ California Emergency Management Agency (CalEMA), 2010. *State of California Multi-Hazard Mitigation Plan*.

³⁹ Alameda County, 2010. *2010 Local Hazard Mitigation Plan – Alameda County Annex*.

⁴⁰ California Emergency Management Agency (CalEMA), 2010. *State of California Multi-Hazard Mitigation Plan*



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- Interstate
- US Highway
- State Highway
- County Highway
-
-
-
- Current Coastal Base Flood (approximate 100-year flood extent)
- Sea Level Rise Scenario Coastal Base Flood + 1.4 meters (55 inches)
- Landward Limit of Erosion High Hazard Zone in 2100
- Coastal Zone Boundary



Figure 4.8-4
San Leandro Quad Sea Level Rise

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Dam inundation maps are used in the preparation of Local Hazard Mitigation Plans (LHMPs) and General Plan Safety Element updates. In addition, CalOES requires all dam owners to develop Emergency Action Plans (EAPs) for warning, evacuation, and post-flood actions in the event of a dam failure.

According to information obtained from the Association of Bay Area Governments (ABAG) website, the Project is located within the inundation areas of two dams: Upper San Leandro Reservoir and Lake Chabot.⁴¹ However, this information was based on 1995 data and is outdated. ABAG no longer provides dam inundation maps on their website. More current data obtained from CalOES 2009 dam inundation maps indicate that the Project site is not within the dam inundation zones of either lake, as shown on Figure 4.8-5.⁴² Lake Chabot is classified as a high hazard dam because its failure could result in a significant loss of life and property damage. The California Division of Safety of Dams (DSOD) inspects each dam on an annual basis to ensure the dam is safe, performing as intended, and is not developing problems.

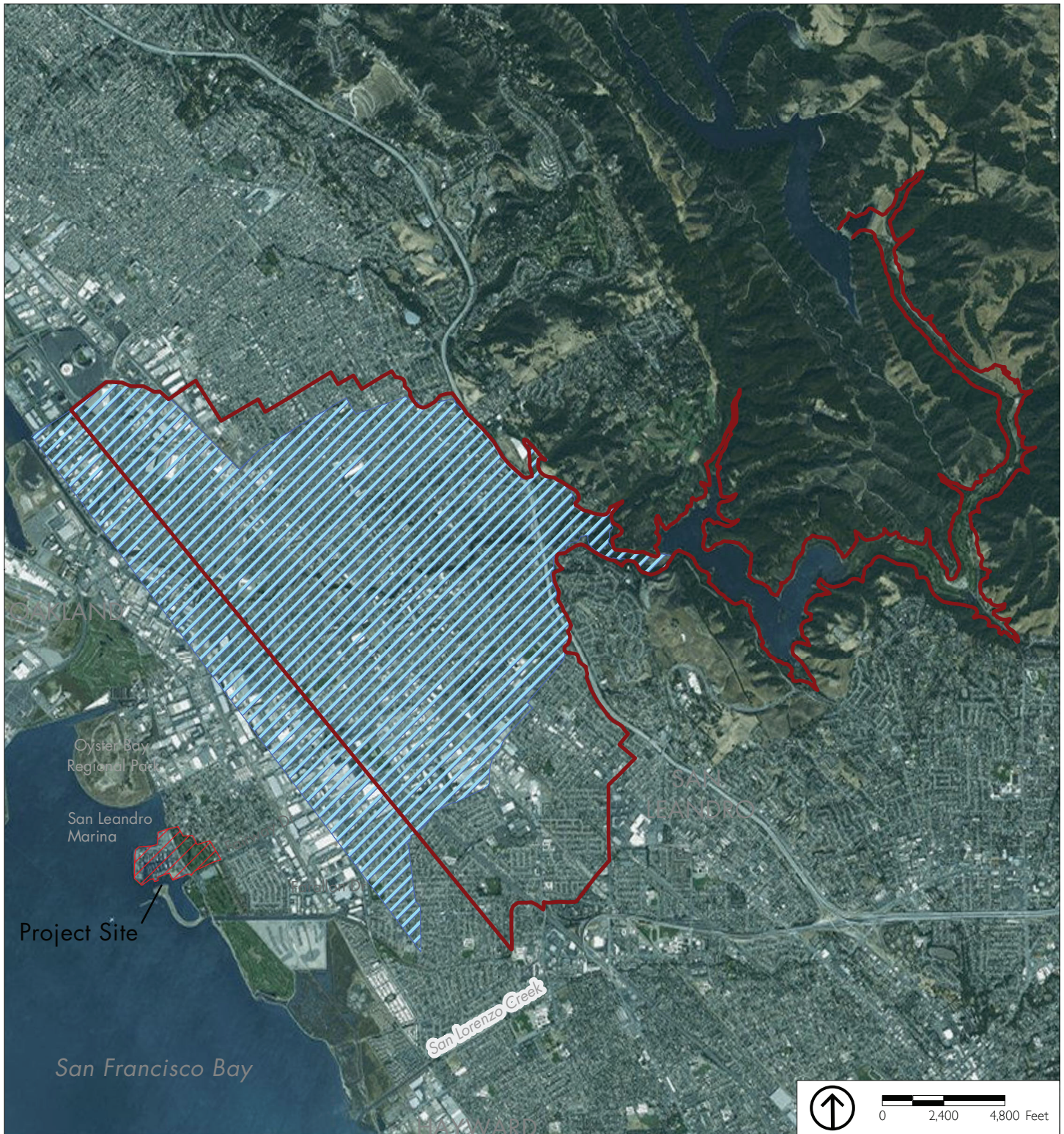
The East Bay Municipal Water District (EBMUD) owns and operates these two reservoirs, which store runoff from local watersheds for water supply. Lake Chabot was built in 1892 and impounds approximately 3 billion gallons of water that is used for non-potable water supply, emergency water supply, conservation/storage of local runoff, and recreation.

Four miles upstream is the Upper San Leandro Reservoir, which was constructed in 1977 and holds more than 13 billion gallons of water. This reservoir is closed to public access, except for the trail system, and is used for raw water storage. While failure of these dams is extremely unlikely, most of San Leandro would be flooded in the event of a dam failure of either Lake Chabot or Upper San Leandro Reservoir.

Requirements for earthquake and flood safety for the EBMUD dams are imposed by the DSOD. Chabot Dam is inspected monthly by EBMUD personnel along with annual inspections by DSOD personnel. DSOD requires that embankments under its jurisdiction are safe enough to withstand a maximum credible earthquake without an uncontrolled release of reservoir water. In 2003, DSOD requested EBMUD to perform a stability evaluation of the Chabot Dam. The results, which were issued in 2005, indicated that upgrading the dam and retrofitting the outlet works was warranted. An Environmental Impact Report (EIR) was certified in December 2013 that discusses the proposed seismic upgrade program in detail and the dam improvements are expected to begin in 2016. However, EBMUD considers both Lake Chabot and Upper San Leandro dams to be stable and does not expect them to breach. The risk of dam failure is extremely low, with seismic strengthening soon to take place at Lake Chabot, and continuing maintenance and further improvements will take place at both dams in the future.

⁴¹ Association of Bay Area Government (ABAG), 2013. *Dam Failure Inundation Maps*, <http://www.abag.ca.gov/cgi-bin/pickdamx.pl>, accessed August 6, 2014.

⁴² California Office of Emergency Services, 2009. *Dam Inundation Registered Images and Boundary Files in Shape File Format*. Version DVD 3, April.



Source: PlaceWorks, 2014; California Governor's Office of Emergency Services, 2007.

Key




-  Dam Inundation Zone for Upper San Leandro Reservoir
-  Dam Inundation Zone for Lake Chabot
-  Project Site

Figure 4.8-5
Dam Inundation Map

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Tsunami, Seiche, and Mudflow

Tsunamis, or seismic sea waves, are oceanic waves that are generated by earthquakes, submarine or shoreline volcanic eruptions, and large submarine or shoreline landslides. Tsunamis have been recorded to reach heights of more than 100 feet and can originate hundreds or even thousands of miles away, averaging 450 miles per hour (mph) across the open ocean. Upon nearing land, the tsunami wave significantly slows, and causes the water ahead of it to recede from shore. Most tsunamis result in very strong and fast tides, rather than giant breaking waves; casualties are often the result of strong currents and floating debris.

Fifty-one tsunamis have been recorded or observed within the San Francisco Bay area since 1850.⁴³ Of these, only two tsunamis caused damage in San Francisco Bay: the 1960 Chile earthquake and the 1964 Alaska earthquake. The 1964 Alaska earthquake caused the most damage of the two and had an amplitude of approximately 1.1 meters (3.6 feet) at the Presidio in San Francisco. The West Coast and Alaska Tsunami Warning Center in Palmer, Alaska, operated by the National Weather Service, is responsible for issuing warnings about potential tsunamis along the West Coast of the United States. Warning times vary depending on the distance to the earthquake. For most tsunamis approaching the coast, several hours are available to evacuate residents and undertake other emergency actions.

Given the history of tsunamis in San Francisco Bay, the risk of flooding due to a tsunami event is considered to be very low for the Project area. Tsunami hazards in San Francisco Bay are much smaller than along the Pacific Coast, because the Bay is an enclosed body of water. However, given the low elevation of the Project site (approximately 5 to 12 feet above sea level) and its proximity to San Francisco Bay, there is a potential for flooding to occur. ABAG has developed tsunami evacuation maps for the Bay Area and the Project site is within the tsunami inundation evacuation zone, as shown on Figure 4.8-6.⁴⁴ It should be noted that the area impacted by flooding from a tsunami typically would be much smaller than the evacuation area.

A seiche is an oscillation wave generated in an enclosed or partially enclosed body of water, such as a lake, reservoir, or harbor, and can be compared to the back-and-forth sloshing in a bathtub. Seiches can be caused by winds, changes in atmospheric pressure, underwater earthquakes, tsunamis, or landslides into the water body. There are no data on the local occurrence or impact of seiches, as none have been recorded in the Bay Area.⁴⁵ Outside the Bay Area, earthquake-generated seiches have on occasion damaged dams and aboveground water storage tanks. In addition, isolated damage to adjacent or downgradient structures has occurred from seiches occurring in swimming pools or small shallow lakes or ponds.

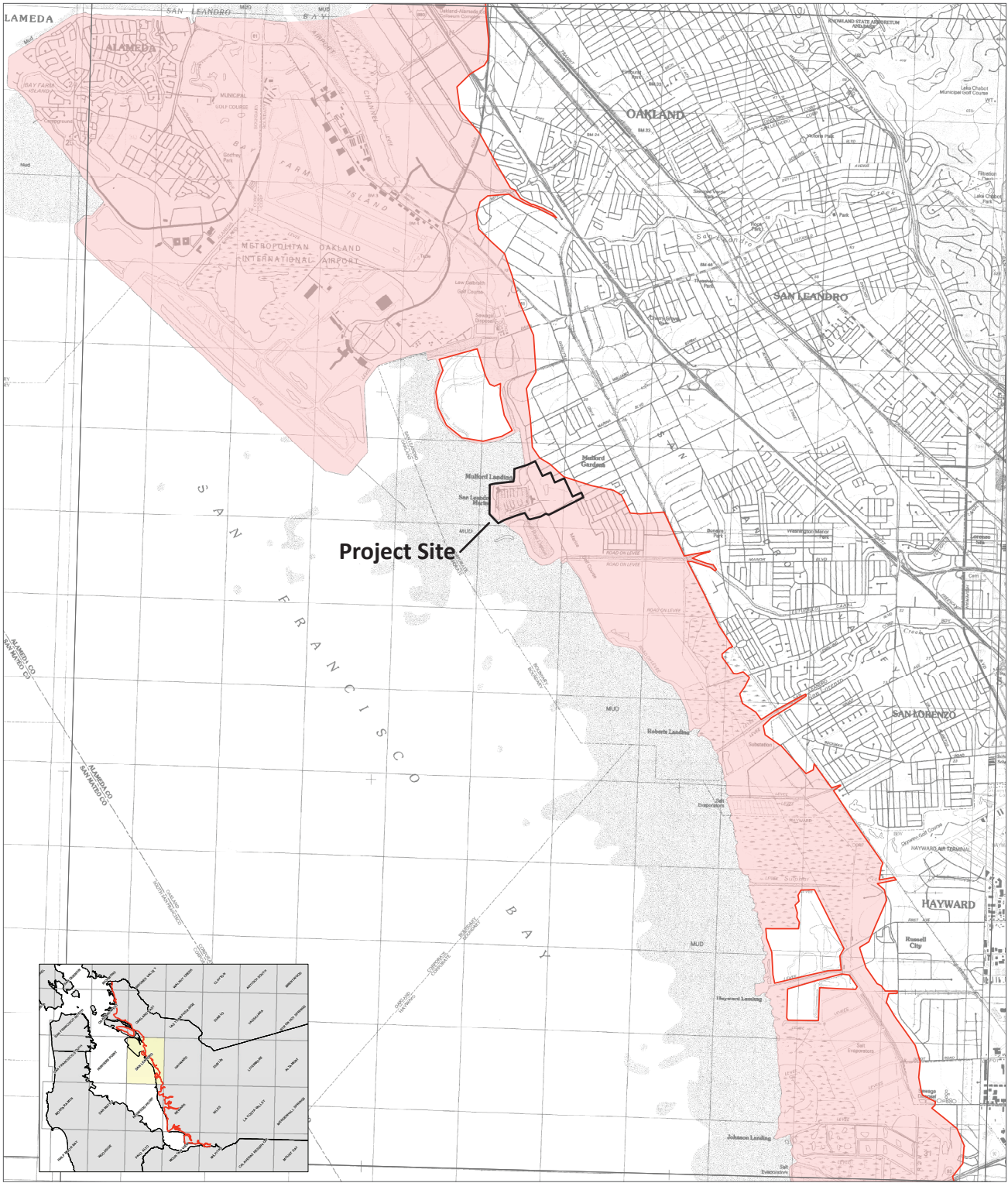
⁴³ The Bay Citizen, 2011. *Mapping Risk: Bay Area Tsunami Plans*. <https://www.baycitizen.org/data/disasters/mapping-risk-tsunami-plans-bay-area/>. Accessed on August 6, 2014.

⁴⁴ Association of Bay Area Governments (ABAG), 2013. *Tsunami Inundation Map for Coastal Evacuation*, <http://gis.abag.ca.gov/website/Tsunami/index.html>, accessed August 6, 2014.

⁴⁵ City of Oakland, 2012. *City of Oakland General Plan, Safety Element*.



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Project Site

0 2
Scale (Miles)



-  Tsunami Inundation Line
-  Tsunami Inundation Area

Figure 4.8-6
Tsunami Evacuation Zone

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In the vicinity of the Project site, there are no nearby aboveground storage tanks or large bodies of water. However, the Project site is southwest of Lake Chabot and Upper San Leandro Reservoir. A seiche could theoretically occur in these reservoirs as the result of an earthquake or other disturbance, but the flooding impact would be less than that of the dam inundation zones. Since the floodwaters from a breach of these dams would not reach the Project site, the potential impact from a seiche would be negligible.

Mud and debris flows are mass movements of dirt and debris that occur after intense rainfall, earthquakes, and severe wildfires. The speed of a slide depends on the amount of precipitation, steepness of the slope, and alternate freezing and thawing of the ground. Most debris flows occur during intense rainfall in areas with steep slopes. The Project site is in a relatively flat area of the City along the coastline. According to the ABAG map of rainfall-induced landslides, it is outside of an area likely to produce debris flows.⁴⁶

4.8.2 STANDARDS OF SIGNIFICANCE

The proposed project would result in a significant hydrology and water quality impact if it would:

1. Violate any water quality standards or discharge requirements.
2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the amount of surface runoff in a manner which would result in substantial erosion or siltation on- or off-site.
4. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
5. Create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
6. Otherwise substantially degrade water quality.
7. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map or place within a 100-year flood hazard area structures, which would impede or redirect flood flows.
8. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a levee or dam.
9. Expose people or structures to a significant risk of inundation by seiche, tsunami, or mudflow.

⁴⁶ Association of Bay Area Government (ABAG), 2014. *Interactive Rainfall-Induced Landslides Map*. Accessed at <http://gis.abag.ca.gov/website/LandslideDistribution/index.html>.

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4.8.3 IMPACT DISCUSSION

HYDRO-1 The Project could potentially violate water quality standards or waste discharge requirements.

The proposed Project would result in a significant environmental impact if it would violate any water quality standards or waste discharge requirements. As described in Section 3.4.1.2, Project Components, of Chapter 3, Project Description, of this draft EIR, the proposed Project would consist of new office space, hotel rooms, housing units, restaurants, associated parking, and various public amenities. The proposed Project's redevelopment of the marina area would require the demolition of several existing structures, including the 462-slip harbor in order to accommodate the proposed Project components. As such, construction and operational impacts associated with the demolition of existing structures and construction of new structures could result in impacts to water quality and waste discharge attributed to water pollution from soil erosion and increased stormwater runoff.

Construction Impacts

Landside Construction

Future construction activities associated with development of the Project could negatively affect the water quality of surface waters. Grading and other earthmoving activities during construction would expose soils, which could be eroded and deposited into downstream receiving waters. This in turn would increase the amount of turbidity and sediment in these water bodies, which could impact aquatic life. Additionally, chemicals or fuels could accidentally spill and be washed into receiving waters.

Future development within the Project area would be required to comply with State and local water quality regulations designed to control erosion and protect water quality during construction. This includes compliance with the requirements of the NPDES General Permit, which requires preparation and implementation of a SWPPP. The SWPPP must include erosion and sediment control Best Management Practices (BMPs) that would meet or exceed measures required by the General Permit, as well as BMPs that control hydrocarbons, trash, debris, and other potential construction-related pollutants. Construction BMPs would include inlet protection, silt fencing, fiber rolls, stabilized construction entrances, stockpile management, solid waste management, and concrete waste management. Implementation of BMPs would prevent or minimize environmental impacts and ensure that discharges during the construction phase of the Project would not cause or contribute to the degradation of water quality in receiving waters. In addition, Chapter 7-12 of the San Leandro Municipal Code requires project applicants to prepare erosion control and sedimentation control plans for submittal to the City Engineer prior to the start of project construction and Chapter 3-12 of the Municipal Code requires BMPs to be implemented to minimize stormwater discharges from the site during construction. Compliance with local and State regulatory requirements and implementation of construction BMPs would minimize discharges during the construction phase of the Project and would not result in the degradation of water quality in receiving waters. Therefore, construction-related water quality impacts are *less than significant*.

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Waterside Construction

Construction and demolition activities associated with the existing marina, docks, and piers have the potential of resulting in temporary water quality impacts. Removal of piers and pilings would result in the temporary re-suspension of sediments and associated increase in turbidity levels. Suspended sediments can lower levels of dissolved oxygen, increase salinity, increase concentrations of suspended solids, and possibly release chemicals present in the sediments into the water column. The degree of turbidity would depend on the quantity and duration of the construction activity, the methods and type of equipment used, and the skill of the operator. However, increased turbidity levels are typically limited to 50 to 150 feet from the construction or demolition activities.⁴⁷ The turbidity impacts are expected to be short-term and localized around the demolition locations. The length of time it takes for the suspended material to settle as well as the current direction and velocity would determine the size and duration of the turbidity plume. Turbidity can be expected to dissipate in a period of 20 to 30 minutes, as was demonstrated at the Dredged Material Management Program Pilot Capping Project in Long Beach.⁴⁸ This project would not involve dredging and given the slow-moving currents in the area, turbidity impacts should dissipate quickly. However, this is considered to be a *significant* impact. Additional analysis associated with these issues in regard to biological resources is provided in Section 4.3 of this EIR.

Impact HYDRO-1A: Construction activities could temporarily degrade water quality with increases in suspended sediment and turbidity and could result in the release of chemicals and hydrocarbon fuels into the water column.

Mitigation Measure HYDRO-1A: Minimize Impacts to Water Quality during Waterside Demolition and Construction Activities. The following mitigation measures are designed to avoid adverse impacts on water quality during waterside demolition and construction activities:

- Piles shall be removed during low tide periods to minimize the amount of sediments re-suspended in the water column.
- When removing piles, the pile shall be hit or vibrated first to break the bond with the sediment, which would minimize the likelihood of the pile breaking and reduce the amount of sediment released into the water column.
- A turbidity curtain shall be installed prior to removing or installing piles or any other waterside activities to minimize turbidity impacts in the water column.
- Piles shall be pulled from the subsurface and quickly placed onto a receiving barge or land to minimize potential releases of creosote, petroleum sheens, and turbidity in the water column. Piles shall not be rinsed or washed. The storage area for the piles shall include straw bales, filter fabric, or other containment devices to contain runoff.
- During removal of the existing dock system, floating rafts and/or trash and debris containment booms shall be placed under the docks and around the areas of demolition to contain debris that may be released during these activities.

⁴⁷ San Diego Unified Port District, 2012. *BAE Systems Pier 4 Replacement Project, Final EIR, State Clearinghouse No. 2012031024, dated August 1, 2012 (certified August 14, 2012).*

⁴⁸ San Diego Unified Port District, 2012. *BAE Systems Pier 4 Replacement Project, Final EIR, State Clearinghouse No. 2012031024, dated August 1, 2012 (certified August 14, 2012).*

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- Any waterside construction activities shall be restricted to the period from June 15 through October when special-status fish species would most likely not be expected within the affected areas.

Significance After Mitigation: Less than significant.

In addition, constituents of concern could potentially be released when bottom sediments are suspended in the water column. These impacts would be transient in nature and the water quality sampling results from the nearest RMP monitoring location to the Project site showed that all analyzed parameters, trace elements, and chemicals were within RWQCB water quality objectives. Therefore, the possibility of sediments containing toxic pollutants creating adverse water quality impacts at the Project site is considered to be *less than significant*.

Removal of the existing dock system will create some debris that has the potential to impact water quality if it is not contained and disposed of properly. And there is the potential for accidental oil or fuel spills to occur during the proposed demolition or construction operations that could impair and/or degrade water quality in the Bay. Such events are likely to be localized spills of refined diesel fuels, gasoline, or lubricating oils. The potential for a leak or spill to occur is low; however, the potential for a significant impact to marine resources or water quality in the Bay is moderate to high.

Further, a small portion of the northern area of the Project site west of Monarch Bay Drive, as shown on Figure 4.3-3 in the Biological Resources section of the EIR, may require a Section 404 permit from the Army Corps and a Section 401 water quality certification from the RWQCB. It could be classified as jurisdictional wetlands; however, a formal determination would be made by the regulatory agencies. Also, the drainage channel along the west side of the golf course could be determined to be regulated waters by the Army Corps. If these areas are considered to be regulated wetlands, then permits and certifications would be issued and would specify methods for ensuring the protection of water quality during construction activities. In addition, the use of BMPs to minimize turbidity, control floating debris, and provide spill containment and cleanup equipment would reduce potential impacts to water quality during waterside construction activities.

Given that there could be impacts to water quality related to construction activities, and because it is unknown whether or not the small portion of the northern area of the Project site west of Monarch Bay Drive would be considered jurisdictional wetland, the potential impact would be considered *significant* impact.

Impact HYDRO-1B: Construction activities could temporarily degrade water quality with increases in suspended sediment and turbidity and could result in the release of chemicals and hydrocarbon fuels into the water column.

Mitigation Measure HYDRO-1B: Minimize Potential for Fuel Releases During Waterside Demolition and Other Construction Activities. The following mitigation measures are designed to avoid potential releases of fuel constituents into the water column during demolition/construction activities:

- A spill contingency plan shall be prepared that addresses the potential for an accidental release of fuel into navigable waterways. The plan shall include floating booms and absorbent materials to

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recover hazardous spills and include provisions for containment, removal, and disposal of spilled materials.

- No fueling, cleaning, or maintenance of vehicles or equipment shall take place within an area where an accidental discharge to navigable waterways may occur.
- All vehicles and equipment operating within or adjacent to the marina or other waterways shall be visually inspected for fuel or waste releases before the beginning of the work day. If spillage or leaks occur during the work day, they shall be noted and recorded and immediate action shall be taken for removal and disposal.
- Floating booms shall be available for containing spills or debris discharged into the water during demolition and construction activities and any debris shall be removed as soon as possible but no later than the end of each day.
- If it is determined that a small portion of the Project site west of Monarch Bay Drive and/or the drainage channel along the west side of the golf course are jurisdictional wetlands or regulated waters by the Army Corps, a Section 404 permit shall be obtained from the Army Corps and a Section 401 water quality certification shall be obtained from the RWQCB. The permit and certification shall specify methods for protecting water quality during construction activities, including BMPs to minimize turbidity, control floating debris, and provide spill containment and cleanup equipment.

Significance After Mitigation: Less than significant.

Operational Impacts

Removal of the marina and associated boats, piers, and docks would have a beneficial impact on water quality. This is because current Marina operations, boater activities, and periodic dredging to maintain the channel have the potential to significantly impact water quality. There also is the potential for the discharge of gray water (galley, bath, and shower water) and black water (sewage) from live-aboards into Bay waters as well as fuel releases of gasoline and diesel from boating activities. With the removal of the marina, there is the potential for improvements over existing water conditions. In addition, the increase in the tidal prism could provide for increased flushing of Bay waters, thereby improving the water quality. An aeration fountain is also proposed in the harbor basin to aid in water circulation, which also would result in water quality improvements.

However, post-construction impacts from landside development of the Project could affect drainage patterns and increase the overall amount of impervious surfaces, thus creating changes to stormwater flows and water quality. Increasing the total area of impervious surfaces can result in a greater potential to introduce pollutants to receiving waters. Urban runoff can carry a variety of pollutants, including oil and grease, metals, sediment, and pesticide residues from roadways, parking lots, rooftops, and landscaped areas depositing them into adjacent waterways via the storm drain system.

Water quality in stormwater runoff is regulated locally by the Alameda County Clean Water Program, which includes the C.3 provisions set by the San Francisco Bay RWQCB. Adherence to these regulations requires new development to incorporate treatment measures, an agreement to maintain them, and other appropriate source control and site design features that reduce pollutants in runoff. Many of the

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requirements consider Low Impact Development (LID) practices, such as the use of bioswales, infiltration trenches, media filtration devices, pervious surface treatments, and bioretention areas. In addition, the Project applicant is required by City ordinance to prepare a Stormwater Management Plan (SWMP) that includes the post-construction BMPs including site design measures, source control measures, and stormwater treatment measures that would be implemented. Neighborhood and lot-level BMPs to promote “green” treatment of storm runoff will be emphasized as voluntary measures, consistent with RWQCB guidance for NDPES Phase 2 permit compliance. BMPs would be designed in accordance with the California Stormwater BMP Handbook for New and Redevelopment or other accepted guidance manuals and all designs would be reviewed and approved by the City of San Leandro prior to the issuance of grading or building permits. BMPs appropriate to control runoff for the Project would include various LID measures as listed above. Since the Project area has a high water table, BMPs that do not rely on infiltration are most appropriate.

In addition, the Project applicant would need to prepare an Operations and Maintenance (O&M) Plan for post-construction water quality and quality control measures, as per Alameda County C.3 provisions. The Project applicant would also need to identify responsibility for maintenance of the stormwater treatment facilities and provide adequate funding to maintain and operate the stormwater improvements. Applicable programs and regulations that apply to the treatment of stormwater runoff during the operational phase of the project would result in water quality impacts at a *less-than-significant* level.

In addition to compliance with SWPPP requirements and implementation of post-construction BMPs, which would ensure that water quality is maintained throughout construction and operation of the proposed Project, there are several San Leandro General Plan policies that reflect regulatory requirements to maintain and improve water quality, as provided in Table 4.8-1.

With implementation of these regulatory requirements, the proposed Project would result in *less than significant* impacts with regard to water quality for the operational phase of the Project.

Significance Before Mitigation: Significant for construction phase of the project.

HYDRO-2 The Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted.)

The proposed Project would result in a significant environmental impact if it would substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. Development of the proposed Project would result in an increase in impervious surfaces. In addition, there may be the potential diversion of groundwater to surface water if short-term construction dewatering is required due to the shallow groundwater table. These activities could result in a decrease in groundwater recharge to the East Bay Plain Subbasin of the Santa Clara Valley Groundwater Basin for which beneficial uses have been established by the San Francisco Bay Basin Plan.

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Dewatering of excavation pits or trenches may be required during construction. However, the Project is not anticipated to adversely impact groundwater resources because required excavations would intersect only the shallow groundwater table and dewatering would temporarily remove groundwater with no impact to the regional groundwater system. Groundwater beneath the Project site is shallow, brackish, non-potable and unsuitable for domestic use. Groundwater extracted during dewatering would likely reflect the characteristics of San Francisco Bay waters because of the close proximity to the Bay and likely subsurface interactions. Dewatering could result in short-term, localized alterations in groundwater levels in the immediate vicinity of the Project site, but this reduction would not result in regional groundwater drawdown. Dewatering activities would require obtaining a Waste Discharge Requirements (WDR) permit from San Francisco Bay RWQCB. The WDR permit requirements would require testing to prevent discharged water from posing a risk to water quality in San Francisco Bay. Should the results of the testing indicate that pollutant levels are too high, treatment of the collected groundwater would be required prior to discharge to San Francisco Bay or the City's storm drain system. In addition, the proposed Project would be subject to SWPPP requirements, which include measures for spill prevention, control, and containment that would prevent potential construction pollutants from leaching into the shallow groundwater. These existing regulatory requirements would ensure that the discharge of construction dewatering would not significantly impact groundwater quality.

The proposed Project would not use or deplete groundwater resources. Water supplied to the City of San Leandro is obtained from the East Bay Municipal Water District (EBMUD) reservoir and aqueduct system. The groundwater aquifer beneath San Leandro is not currently used for water storage or supply; EBMUD relies on surface water and recycled water to meet water supply demands for its customers.⁴⁹ Similarly, the proposed Project would not involve the construction of new groundwater wells or the use of existing wells. The residential housing units on the Marina Golf Course would be supplied with EBMUD water. Therefore, the Project would not deplete the production level of nearby wells.

The implementation of Low Impact Development (LID) measures and on-site infiltration, as required under the C.3 provisions of the Alameda County Clean Water Program will increase the potential for groundwater recharge. Also, the use of site design features as per the C.3 provisions and implementation of water use efficiency measures mandated by the Water Conservation Act of 2009 will ensure that groundwater supplies are not depleted and impacts would be less than significant. Although not required by codes or regulations, the General Plan goals and policies listed in Table 4.8-1 encourage groundwater recharge so that future development would be served with an adequate water supply.

The proposed Project will not use groundwater supplies or interfere with groundwater recharge; therefore, the impact would be considered *less than significant*.

Significance Before Mitigation: Less than significant.

⁴⁹ East Bay Municipal Utility District (EBMUD), 2011. *Water Management Plan 2011*. Adopted by EBMUD Board in April 2012.

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HYDRO-3 The Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the amount of surface runoff in a manner which would result in substantial erosion or siltation on- or off-site.

The proposed Project does not involve the alteration of any watercourse, stream, or river. However, construction activities for the Project would involve demolition of existing structures and removal of the 462-slip harbor, grading, excavation, and the construction of buildings, sidewalks, driveways, and parking lots, which could increase the potential for erosion and/or siltation. As previously discussed under HYDRO-1, standard erosion and sediment control measures are required and would be implemented as part of the SWPPP for the proposed Project to minimize the risk during construction. The SWPPP must include an erosion control plan that prescribes measures such as phasing of grading, limiting areas of disturbance, designation of restricted-entry zones, diversion of runoff away from disturbed areas, protective measures for sensitive areas, outlet protection, and provisions for re-vegetation or mulching. The erosion control plan would also include treatment measures to trap sediment once it has been mobilized, including inlet protection, straw bale barriers, straw mulching, straw wattles, silt fencing, check dams, terracing, and siltation or sediment ponds. In addition, Chapter 7-12 of the San Leandro Municipal Code requires project applicants to prepare erosion control and sedimentation control plans for submittal to the City Engineer prior to the start of project construction. With implementation of these measures during construction, there would not be a substantial increase in surface runoff resulting in significant erosion or siltation and the impact would be *less than significant*.

Once projects within the Project site have been constructed, the C.3 requirements for new development would include source control measures, site design measures, LID, and treatment measures that address stormwater runoff and would reduce the potential for erosion or siltation. Because the proposed Project involves the creation or replacement of 10,000 square feet or more of impervious surface, post-construction stormwater treatment is required to ensure that discharge rates of stormwater generated during a peak storm event would not exceed pre-construction levels. All detention or stormwater treatment facilities would be designed to the standards of the City of San Leandro and the ACFCO. Several of the General Plan goals and policies listed in Table 4.8-1 also reflect implementation of regulatory requirements for drainage improvements to ensure that stormwater runoff is adequately handled and would not contribute to on-site or off-site erosion.

Compliance with the established regulatory requirements cited above will ensure that impacts from erosion and siltation both on- and off-site will be *less than significant*.

Significance Before Mitigation: Less than significant.

HYDRO-4 The Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial flooding on- or off-site.

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Development within the Project site and the change in land use would result in an increase in impervious surfaces that could cause an increase in stormwater runoff, higher peak discharges to drainage channels, and the potential to cause flooding if adequate drainage facilities are not available. However, future development associated with this Project does not involve the alteration of any watercourse, stream, or river. The Project site has an existing storm drain system and new development would require infrastructure improvements to connect with the existing system.

The waterside portion of this Project will not result in an alteration of existing drainage patterns. Removal of the 462-slip harbor and associated piers and piling and the addition of an aeration fountain would improve water circulation patterns. Portions of the project west of Monarch Bay Drive would be constructed on previously developed areas that are covered in impervious surfaces and would not alter existing drainage patterns.

The portion of the Project east of Monarch Bay Drive would be constructed on the existing Marina Golf Course and would involve the creation of 10,000 feet or more of impervious surface and the disturbance of more than one acre of land. This would trigger the implementation of construction phase BMPs, post-construction design measures that encourage infiltration in pervious areas, and post-construction source control measures to help keep pollutants out of stormwater, as per the C.3 provisions of the Alameda County Clean Water Program.

During construction, the Project is subject to NPDES construction permit requirements, including preparation of a SWPPP, which includes BMPs to limit the discharge of sediment and non-stormwater discharges from the site. Once constructed, the C.3 provisions would include source control measures and site design measures to address stormwater runoff. In addition, stormwater treatment measures are required to contain site runoff, using specific numeric sizing criteria based on volume and flow rate. Previous discussions describe the specific SWPPP, BMP, and C.3 measures that may be implemented for the Project. All detention or stormwater treatment facilities would be designed to the standards of the City of San Leandro and the ACFCD.

With implementation of these control measures and regulatory provisions to limit runoff from new development sites, the proposed Project would not result in significant increases in runoff that could contribute to on-site or off-site flooding. Therefore, implementation of the proposed Project would have a *less-than-significant* impact with respect to alterations in drainage patterns that could result in flooding.

Significance Before Mitigation: Less than significant.

HYDRO-5	The Project would not create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
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An increase in impervious surfaces with development of the proposed Project could result in increases in stormwater runoff, which in turn could exceed the capacity of existing or planned stormwater drainage systems. There currently is no piped storm drain system along the two peninsulas that encircle the harbor (except for isolated catch basins draining to San Francisco Bay) and there is no storm drainage system at the Marina Golf Course. With new development in these areas and the areas north of Mulford Point Drive and south of Pescador Point Drive, an adequately sized storm drainage system to convey on-site

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stormwater runoff to existing storm drain facilities would need to be constructed. The on-site systems would be subject to City and ACFCD review to verify that they meet C.3 provisions for stormwater runoff and that they would not exceed the capacity of downstream drainage systems. The ACFCD is in the process of developing a Hydrology and Hydraulics Manual to provide guidance on sizing and designing drainage systems, based on prescribed storm events. The C.3 provisions cover the construction of stormwater treatment systems and incorporate flow-based and volume-based hydraulic sizing criteria.

In addition, the City of San Leandro would require as a standard condition of approval that developers verify that on-site and off-site drainage facilities can accommodate increased stormwater flows. In addition to building and extending on-site storm drainage infrastructure, the Project applicant will be required to pay for improvements to the storm drain system necessary to accommodate increased flows from the development. Also, implementation of C.3 provisions for new development, which include LID design and bioretention areas, flow-through planters, vegetated buffer strips, and/or on-site retention facilities, would minimize increases in peak flow rates or runoff volumes. Furthermore, the General Plan goals and policies listed in Table 4.8-1 would encourage development that would not exceed the capacity of existing or proposed storm drain systems.

With implementation of these regulatory requirements listed above, impacts to storm drain system capacities would be *less than significant*.

Significance Before Mitigation: Less than significant.

HYDRO-6 The Project would not otherwise substantially degrade water quality.

As discussed previously, the principal sources of water pollutants from the proposed Project are runoff with oil and grease, metals, sediment, and chemicals from roadways, parking lots, rooftops, and landscaped areas. Implementation of the Project would require source control, site design, and LID measures to be incorporated in the Project design features, in compliance with the C.3 provisions for stormwater in Alameda County. Implementation of these stormwater control measures, such as bioretention areas and flow-through planters, would provide natural filtration of pollutants from stormwater runoff prior to entry into the storm drain system or San Francisco Bay. As such, the Project would improve the treatment of stormwater on-site and reduce stormwater pollution, thus ensuring that impacts would be *less than significant*. Additionally, compliance with San Leandro Municipal Code Section 3-15, Stormwater Management and Discharge Control, which establishes measures to minimize and reduce runoff entering the stormwater system, would further protect water quality during Project construction and operation. Therefore, development of the proposed Project would not otherwise substantially degrade water quality and impacts would be *less than significant*.

Significance Before Mitigation: Less than significant.

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HYDRO-7 The Project would place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, would place structures within a 100-year flood hazard area which would impede or redirect flood flows, or would place housing or structures within areas subject to sea level rise and/or coastal high hazards.

Although most of the proposed Project is outside of the 100-year floodplain, the area south of Pescador Point Drive, which is proposed for mixed use development, is within the 100-year floodplain designated as Zone VE – coastal flood hazard subject to wave velocity. Therefore, the proposed Project would result in the placement of residential structures in a FEMA-designated 100-year Special Flood Hazard Area (SFHA). The area within the 100-year floodplain is shown on Figure 4.8-2.

However, as discussed previously in the flooding section under *Existing Conditions*, FEMA is currently revising the Flood Insurance Rate Maps (FIRMs) for all nine counties surrounding San Francisco Bay. This includes the FIRMs for the City of San Leandro. The preliminary FIRM shows that the area south of Pescador Point Drive would no longer be within the 100-year floodplain. However, the area of the project east of Monarch Bay Drive would be designated as within the 100-year floodplain (Zone AE) with a base flood elevation (BFE) of 10 feet above mean sea level (msl). As discussed previously, the City of San Leandro and Alameda County Public Works Department are working together to implement actions that would eliminate 1,000 properties from the preliminary FIRMs. If negotiations with FEMA are successful, it is likely that no portions of the project site would be within the 100-year floodplain. However, for purposes of this discussion, it is assumed that the portion of the site south of Pescador Point Drive could be in the 100-year floodplain (Zone VE) and the portion of the site east of Monarch Bay Drive could be in the 100-year floodplain (Zone AE).

Because the portion of the Project south of Pescador Point Drive is also located in a coastal high hazard area (Zone VE), additional building requirements would apply. These requirements can be found in the FEMA NFIP requirements for new construction and San Leandro's Municipal Code, Chapter 7-9-530, *Coastal High Hazard Areas*. The requirements pertain to the siting of the building, the elevation of the lowest floor in relation to the Base Flood Elevation (BFE), the foundation design, and enclosures below the lowest floor. For example, the bottom of the lowest horizontal member must be above the BFE and within the VE zone, any portion of the building below the BFE must be less than 299 square feet and can only be used for storage, parking, and access (SPA). All structures should be elevated one to three feet above the BFE, which can result in significant reductions in flood insurance premiums⁵⁰ as further described below.

All new construction must be located landward of the reach of mean high tide (i.e., the mean high water line).⁵¹ All new construction also must be elevated on pilings, posts, piers, or columns so that the bottom of the lowest horizontal structural member of the lowest floor is at or above the BFE, which is 10 feet mean sea level using the North American Vertical Datum of 1988 (NAVD88) at this location. The piling or column foundations must be anchored to resist flotation, collapse, and lateral movement due to the

⁵⁰ Information provided by Mr. Jerry Smith, City of San Leandro Chief Building Officer and Flood Plain Administrator.

⁵¹ City of San Leandro, 2014. *San Leandro Municipal Code, Chapter 7-9 Floodplain Management, Section 7-9-530, Coastal High Hazard Areas*.

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effects of wind and water loads. A registered engineer or architect must develop or review the structural design and plans for construction and certify that the design and methods of construction are in accordance with accepted standards. In addition, erosion control structures as well as bulkheads, seawalls, and retaining walls cannot be attached to the building or its foundation. Fill may not be used for the structural support of any building, but minor grading and the placement of minor quantities of fill is permitted for landscaping and drainage purposes and for support of parking slabs, pool decks, patios, and walkways. Finally, the space below all new construction must be either free of obstruction or enclosed only by non-supporting breakaway walls, open wood latticework, or insect screening. NFIP requirements also specify permitted uses below the BFE, the use of flood damage-resistant materials below the BFE, and placement of mechanical/utility equipment below the BFE.

Prior to the start of construction or development, the City of San Leandro will require Project applicants to obtain a development permit from the City's Floodplain Administrator and construct new development in accordance with the standards provided in Chapter 7-9-530, *Coastal High Hazard Areas*. Prior to occupancy of any building, proof that a Letter of Map Revision (LOMR) and an elevation certificate has been obtained from FEMA must be provided to the City. Although compliance with the FEMA and City Municipal Code requirements would reduce potential flood hazards, this is considered to be a *significant* impact.

BCDC has published sea level rise inundation maps for low-lying areas within San Francisco Bay. Much of the Project site, including the residential development on the Marina Golf Course, is within the area vulnerable to a projected sea level rise of 16 inches by the year 2050 and a sea level rise of 55 inches by 2100.⁵² These sea level rise inundation predictions by BCDC relate to tidal flooding and storm surge, but do not incorporate coincident watershed flooding, which would increase flood hazards in areas affected by sea level rise and increases in tide levels. The individual and collective responses of Bay Area counties and municipalities to this flooding potential are in the early stages of development. However, the City of San Leandro and Alameda County are in the process of implementing policies and programs to adapt to the changing climate and to utilize estimates of sea level rise and incorporate data into mapping of areas subject to future inundation. Development within areas shown to be impacted by sea level rise, as shown on the BCDC maps, is considered to be a significant impact.

In addition, the City goals and policies that apply to the proposed Project, as listed in Table 4.8-1 would encourage development that reduces the impacts from flooding. In particular, Policy 29.06, *Construction in the Floodplain* and Action 29.06A, *FIRM Amendments*, pertain to these issues.

The FEMA FIRM panels are in the process of being revised, with input provided by the City of San Leandro and Alameda County Public Works Department. It is not known at this time if the portions of the Project that currently are in the designated floodplain would be removed from this designation or whether other portions of the Project could be included to be within the 100-year floodplain. Because there is the potential for housing to be placed within a 100-year flood hazard area, the impact is considered to be *significant*.

⁵² San Francisco Bay Conservation and Development Commission (BCDC), 2014. *San Francisco Bay Scenarios for Sea Level Rise Index Map*. At http://www.bcdc.ca.gov/planning/climate_change/index_map.shtml. Accessed on August 13, 2014.

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Impact HYDRO-7: The Project would place housing within the 100-year floodplain and within areas subject to sea level rise/coastal high hazard.

Mitigation Measure HYDRO-7: Minimize Potential for Flooding for Housing within the 100-Year Floodplain and within Areas Subject to Sea Level Rise/Coastal High Hazard. The current FEMA FIRM panels are undergoing revisions and it is possible that no portions of the Project site will be within the 100-year floodplain when the Project is scheduled to start construction. However, because a portion of the Project site is currently within the 100-year floodplain and a portion of the Project site could be designated as being within the 100-year floodplain, the following mitigation measures are applicable:

- Prior to the start of construction or development, the Applicant shall obtain a development permit from the City's Floodplain Administrator. The application shall include the proposed elevation in relation to mean sea level of the lowest floor (including basement) of all structures and the proposed elevation in relation to mean sea level to which any structure will be flood-proofed in accordance with the City's Municipal Code requirements under Chapter 7-9, *Floodplain Management*.
- All provisions for building within the 100-year floodplain that are specified in the FEMA NFIP requirements and the City's Municipal Code shall be implemented to minimize the risk of flood damage.
- A registered engineer or architect shall develop or review the structural design and plans for construction and certify that the design and methods of construction are in accordance with Federal, State, County, and City standards.
- Prior to the issuance of building permits, a Letter of Map Revision (LOMR) and elevation certificate shall be submitted to the City's Chief Building Official. The bottom of the lowest horizontal structural member of the lowest floor shall be at or above the BFE. Also, any structure below the BFE in the VE zone shall be less than 299 square feet and shall only be used for storage parking, or access (SPA).
- Prior to the start of construction or development, the latest version of the FIRM maps shall be reviewed to determine if portions of the Project site are within the 100-year floodplain and to determine the status of actions taken by the City of San Leandro and the Alameda Public Works Department to remove 1,000 properties from the preliminary FIRM maps. If any portion of the Project site is determined to be within the 100-year floodplain, then the mitigation measures listed above shall be applicable.
- Prior to issuance of a tentative map, a sea level rise risk assessment shall be prepared and submitted to the City for areas of the Project that are subject to sea level rise. . The risk assessment shall be prepared by a qualified engineer and shall be based on the estimated 100-year flood elevation and the best estimates for future sea level rise and current and future flood protection. A range of sea level rise projections for mid-century and end of century shall be used in the risk assessment along with inundation maps. The risk assessment shall identify all types of potential flooding, degrees of uncertainty, consequences of defense failure, and risks to existing habitat from proposed flood protection devices. The Project shall be designed to be resilient to a mid-century sea level rise projection. If the Project would remain in place longer than mid-century, an adaptive management plan shall be developed to address the long-term impacts that would arise. The results of the risk assessment shall be incorporated into the site design, as

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reflected in the site plan review and tentative map review. The sea level rise risk assessment shall also be submitted to BCDC for review and approval for the areas of the project that are within BCDC's jurisdiction (i.e., within 100 feet of the shoreline), prior to the start of construction or development. .

Significance After Mitigation: Less than significant.

HYDRO-8 The Project would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

According to the Association of Bay Area Governments (ABAG), the proposed Project is located within the inundation area of two dams: Upper San Leandro Reservoir and Lake Chabot. However, the ABAG inundation maps were developed using information from the 1970s. Since the 1975 inundation map for Lake Chabot was developed, a more recent modeling study (July 2008) conducted as part of the seismic stability analysis predicted a smaller dam inundation zone.⁵³ In addition, the Upper San Leandro Reservoir dam inundation map was updated in 2007 by CalOES. The results show that released water from the dams would not reach the Project site and the Project would not be within any dam inundation zone, as shown on Figure 4.8-4. Also, the risk of dam failure is extremely low and there is no historic record of any dam failure in San Leandro or the Bay Area. Therefore, there would be *no impact* associated with flooding as the result of a dam failure.

Significance Before Mitigation: No impact.

HYDRO-9 The Project would not result in inundation by seiche, tsunami, or mudflow.

A significant impact could occur if the project site is close to the ocean or other water body, which would render it susceptible to the effects of seismically-induced tidal phenomena (seiche or tsunami) or if the site is located adjacent to a hillside area with soil characteristics that would indicate susceptibility to mudslides or mudflows. Since the project site is in a flat, coastal area, there is no potential for impacts due to mudflows.

The risk of flooding due to a tsunami event is considered to be very low within the City of San Leandro due to its location near the east-central portion of San Francisco Bay and the history of minimal tsunami damage within the San Francisco Bay area. The Santa Cruz Marina was impacted by a tsunami in 2011 that originated from an 8.9 magnitude earthquake in Japan, causing major damage to boats and docks. Other harbors and marinas along the California Coast, including Crescent City, were also impacted; however, there was no reported damage to the marinas within San Francisco Bay. Of 51 tsunamis observed in San Francisco Bay since 1850, only two tsunamis caused damage in San Francisco Bay and the maximum

⁵³ East Bay Municipal Utility District (EBMUD), 2008. *Inundation Map for Chabot Dam Based on 2006 Chabot Dam Break Analysis*, July.

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amplitude was 3.6 feet at the Presidio in San Francisco, which is near the outlet to the Pacific Ocean. Nevertheless, the proposed Project is within the tsunami inundation zone, as mapped by ABAG.

Many areas of San Leandro and other coastal cities are within tsunami inundation zones and there are various precautions and warning systems that would be implemented by the City in the event of a tsunami. The City uses Nixle, an automated telephone and text message system that can notify affected portions of the community when emergency alerts or notifications are needed. Also, the National Oceanic and Atmospheric Administration (NOAA) operates the National Tsunami Warning Center and the Pacific Tsunami Warning Center that alert local authorities to order the evacuation of low-lying areas, if necessary. Due to the infrequent nature of tsunamis and relatively low predicted tsunami wave height in the area, the proposed Project is reasonably safe from tsunami hazards. Furthermore, any development for the Project would be subject to the City's flood elevation standards for lands within Special Flood Hazard Areas (SFHAs), as defined by FEMA (Section 7-9 of the San Leandro Municipal Code). Therefore, the potential impact of flooding from tsunamis would be *less than significant*.

There are no large bodies of water, such as reservoirs or lakes, within San Leandro that would create an impact from seiches. A seiche could theoretically occur in the Upper San Leandro Reservoir and Lake Chabot as the result of an earthquake or other disturbance, but the flooding impact would be less than the dam inundation zones. Since the dam inundation maps show that flooding from dam breaches would not reach the Project site, there would be no impact from seiches as well. The long distances of shallow water in San Francisco Bay would minimize waves generated by a seiche, resulting in a *less than significant* impact. The Project site is in a relatively flat area of the City and according to the ABAG map of rainfall-induced landslides, it is outside of an area likely to produce mud slides or debris flows.

In summary, although the project site is in a tsunami inundation zone, the City and County's tsunami warning system coupled with the infrequent nature of tsunamis and low predicted wave heights for tsunamis or seiches in the area would result in *less than significant* impacts.

Significance Before Mitigation: Less than significant.

4.8.4 CUMULATIVE IMPACTS

HYDRO-10 The Project, in combination with past, present, and reasonably foreseeable projects, would not result in significant cumulative impacts with respect to hydrology and water quality.

The analysis of cumulative hydrology and water quality impacts considers the larger context of future development within the San Leandro Marina Watershed, which encompasses the Project site. Cumulative impacts can occur when impacts that are significant or less than significant from a proposed project combine with similar impacts from other past, present, or reasonably foreseeable future projects in a similar geographic area. Cumulative impacts could result from incremental changes that degrade water quality or contribute to drainage and flooding problems within the watershed.

As discussed previously, development of the proposed Project and other cumulative projects within the watershed would require conformance with extensive State and local policies and regulations that would

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ensure hydrology and water quality impacts would be less than significant . Any new development within the watershed would be subject to City policies and ordinances, design guidelines, zoning codes, and other applicable City requirements that address impacts related to hydrology and water quality. More specifically, potential changes related to stormwater quality, stormwater flows, drainage, impervious surfaces, and flooding would be minimized or avoided by the implementation of stormwater control measures, retention, infiltration, and LID measures, and review by the City's Engineering and Transportation Department to integrate measures to reduce potential flooding impacts. With the implementation of these measures, the impacts to water quality and hydrology would be *less than significant* for cumulative projects within the San Leandro watershed.

The water quality regulations implemented by the San Francisco Bay RWQCB take a basin-wide approach and consider water quality impairment in a regional context. For example, the NPDES Construction Permit ties receiving water limitations and basin plan objectives to terms and conditions of the permit, and the MS4 Permit works with all municipalities to manage storm water systems to be collectively protective of water quality. In addition, the implementation of goals and policies under the proposed Project and other projects within the watershed would require coordination with the ACFCD to minimize potential impacts to water quality and hydrology with planned development. For these reasons, impacts from future development within the watershed on hydrology and water quality are not cumulatively considerable and would not result in a significant cumulative impact with respect to hydrology and water quality.

The Project site comprises a small portion of the San Leandro Marina Watershed (less than 10%) and is one of many planned projects within the City of San Leandro. This Project also would be subject to all of the State and local policies and regulations that would ensure hydrology and water quality impacts would be less than significant . As such, the Project's contribution would not be cumulatively considerable and the impact would be *less than significant*.

Significance Before Mitigation: Less than significant.

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