

### 3.3 HYDROLOGY AND WATER QUALITY

This section describes the existing hydrological setting, including water quality, on the project site and vicinity, as well as the various relevant hydrology and water quality regulations and policies that pertain to the project site. The general and site-specific discussion of hydrology and water quality contained herein provides the environmental baseline by which environmental impacts are identified and measured. Environmental impacts are discussed in **Section 4.0**.

#### 3.3.1 REGULATORY SETTING

##### *FEDERAL REGULATORY SETTING*

##### *Clean Water Act*

The Clean Water Act (CWA) (33 USC 1251-1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” The United States Environmental Protection Agency (USEPA) is delegated as the authoritative body under the CWA.

##### *Beneficial Uses and Impaired Waterbodies*

Sections 303 and 304 of the CWA outline provisions for the development of water quality standards, identification of impaired waterbodies, and guidelines for improving water quality throughout the nation. States are required to designate beneficial uses for jurisdictional waters (regardless of existing quality). Section 303(d) of the CWA requires states to identify waterbodies within their planning jurisdiction that are impaired in such a manner that beneficial uses cannot be maintained. States are required to develop total maximum daily loads (TMDLs), which are qualitative and quantitative measures designed to improve water quality to maintain designated beneficial uses. TMDLs establish limits for total pollution loading in waters that do not currently meet, or are not expected to meet, applicable water quality standards.

##### *Water Quality Certification*

Section 401 (Water Quality Certification) requires conformity between a federal permit for and a states ability to comply with other sections of the CWA. Under Section 401, an applicant must verify to the federal permitting agency, that the permitted action would not impede the states (of which the project is located) ability to comply with other provisions of the CWA. On fee lands Section 401 Water Quality Certification is the responsibility of the Regional Water Quality Control Board (RWQCB), while on trust lands this certification is the responsibility of the USEPA in accordance with federal Trust responsibilities.

### *National Pollutant Discharge Elimination System*

Section 402 of the CWA establishes a national permitting system known as the National Pollutant Discharge Elimination System (NPDES) that regulates the discharge of pollutants (except for dredged or fill material, which is covered under Section 404 of the CWA) into waters of the United States. Project applicants that propose to discharge waste to a Waters of the U.S. are required to obtain a NPDES permit for such discharges. If issued, the permit includes discharge limitations (Waste Discharge Requirements) that are based on the quality of the receiving water and designed to maintain beneficial uses. For Federal projects, the USEPA is the permitting agency. In California, for local projects the USEPA has delegated control of the NPDES permitting program to the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). Each NPDES permit contains limits on pollutant concentrations of wastes discharged to surface waters to prevent degradation of water quality and protect beneficial uses.

Federal policy (40 CFR 131.6) specifies that each state must develop, adopt, and retain an anti-degradation policy to protect the minimum level of surface water quality necessary to support existing uses. Each state must also develop procedures to implement the anti-degradation policy through water quality management processes. Each state anti-degradation program shall include policy and implementation methods consistent with the provisions outlined in 40 CFR 131.12 (USEPA, 1994). California's antidegradation policy is outlined below under State Regulatory Setting.

In 1990, an amendment to the CWA directed the NPDES permitting program to address non-point source pollution from construction activities. Construction activities include clearing, grading, excavation, dewatering of shallow groundwater, stockpiling, and reconstruction of existing facilities involving removal and replacement. Applicants with construction projects disturbing five or more acres of soil are required to file for coverage under the NPDES permitting process. In 1999, the CWA was amended to require construction sites disturbing one to five acres to file for coverage under the NPDES permitting process. For federal projects, the applicant must apply for coverage under the USEPA's general NPDES permit for construction. Project proponents are required to submit a complete Notice of Intent (NOI). A complete NOI package consists of an NOI form, site map, and fee. The General Permit also requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP contains a site map showing the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and treatment systems, discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list Best Management Practices (BMPs) that will be implemented during construction and operation to address stormwater runoff rates and quality and dewatering provisions. BMPs include the following categories:

- Site Planning Considerations such as preservation of existing vegetation;
- Dewatering provisions to prevent contact with surface water resources such as land application for non-contaminated sources at rates preventing runoff, treatment for contaminated sources and

associated land disposal, use for dust suppression, or disposal at a permitted facility such as a wastewater treatment plant.

- Vegetation Stabilization through methods such as seeding and planting;
- Physical Stabilization through use of dust control and stabilization measures;
- Diversion of Runoff by utilizing earth dikes and temporary drains and swales;
- Velocity Reduction through measures such as slope roughening/terracing; and
- Sediment Trapping/Filtering through use of silt fences, straw bales and sand bag filters, and sediment traps and basins.

### ***Safe Drinking Water Act***

Minimum national drinking water standards are established through the 1974 Safe Drinking Water Act (42 U.S.C. § 300f *et seq.*) (amended in 1986 and 1996). Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. USEPA regulates these types of contaminants through the development of national primary Maximum Contaminant Levels (MCLs) for finished water. These are legally enforceable standards that apply to public water systems. These standards are established to protect human health by limiting the levels of contaminants in drinking water. The USEPA also defines National Secondary Drinking Water Regulations (secondary standards). These secondary standards are non-enforceable. They regulate contaminants that cause cosmetic effects or aesthetic effects. A list of primary and secondary MCLs can be found at: <http://www.epa.gov/safewater/contaminants/index.html>.

### ***Federal Emergency Management Agency***

The Federal Emergency Management Agency (FEMA) is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers (USACE) studies. Floodplain management is addressed in executive Order 11988, which requires the evaluation of actions taken in a floodplain. Specifically, the order states that agencies shall first determine whether the proposed action will occur in a floodplain. Second, if an agency proposes to allow an action to be located in a floodplain, “the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains.” Finally, if the only practicable alternative action requires siting in a floodplain, the agency shall “minimize potential harm to or within the floodplain.”

FEMA is also responsible for distributing Flood Insurance Rate Maps (FIRMs), which are used in the National Flood Insurance Program (NFIP). These maps identify the locations of special flood hazard areas, including 100-year floodplains. A 100-year flood event is defined as a flood event which would have a one in 100 chance of occurring each year.

FEMA restricts cumulative development from increasing the water surface elevation of the base flood by more than one foot within the floodplain. These standards are implemented at the local level through

state-mandated local ordinances as described below under State Regulatory Setting and Local Regulatory Setting.

### ***Coastal Zone Management Act***

The Federal Coastal Zone Management Act permits the San Francisco Bay Conservation and Development Commission (BCDC) to review Federal projects and projects that require Federal approval or are supported with Federal funds, in addition to carrying out its regulatory authority under State law (see below). Federal project applicants must provide project details to the BCDC, ~~however while no formal permits are required, BCDC~~ which will make a Consistency Determination of the project.

### ***STATE REGULATORY SETTING***

#### ***Porter-Cologne Water Quality Control Act***

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for surface water and groundwater quality regulation within California. The Act established the authority of the SWRCB and the nine RWQCBs. The SWRCB administers water rights, water pollution control, and water quality functions throughout the State, while the RWQCBs conduct planning, permitting, and enforcement activities within designated regions. The project site is located along the northeastern edge of the San Francisco Bay (Bay), under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB).

The Act requires the State, through the SWRCB and the RWQCBs, to designate beneficial uses of surface waters and groundwaters, and specify water quality objectives designed to protect those uses. These water quality objectives are presented in the *Regional Water Quality Control Plans* (Basin Plans).

Any action that may result in the discharge of pollutants that could affect the quality of the State's waters must file a "report of waste discharge" (RWD) with the RWQCB when applying for coverage under the State's implementation of the NPDES permitting program. The RWQCB staff analyzes the RWD and characteristics of the proposed discharge and prepares draft waste discharge requirements (WDRs), which constitute a conditioned permit for the discharge. Publicly owned treatment plants must also acquire WDRs prior to discharging treated effluent to land. WDRs contain operational requirements, contaminant limitations, and monitoring requirements.

#### ***SFBRWQCB's Antidegradation Policy***

Basin Plans are developed and periodically reviewed to fulfill the State's requirements of the anti-degradation policy of the CWA. These plans designate beneficial uses within California's major rivers and groundwater basins, and establish water quality objectives within waters located in each region. The beneficial uses identified within each Basin Plan describe the qualities and services that are derived from a water body. In turn, water quality objectives are intended to protect and support the continued viability of beneficial uses. Implementation of Basin Plans occurs primarily through issuance of WDRs. Each

Basin Plan provides a technical basis for determining WDRs and, when necessary, regulatory enforcement action.

### ***NPDES Permitting Program***

~~In California, construction projects under the jurisdiction of the State~~ In accordance with the CWA, the USEPA has delegated permitting authority under the NPDES permitting program to the State of California. Therefore, projects under the jurisdiction of the State (such as the components of the project alternatives proposed for development on lands held in fee title) must apply to either the SWRCB for general permits or the local RWQCB for individual permits. For example, construction projects under the jurisdiction of the State that disturb greater than one acre of land must apply for coverage under the State's general permit: SWRCB, Order No. 99-082009-0009-DWQ, NPDES General Permit No. CAS000002 for Discharges of Stormwater Runoff Associated with Construction Activity (General Permit).

### ***San Francisco Bay Conservation and Development Commission***

The BCDC was established as a California State agency to accomplish two primary goals: 1) to prevent the unnecessary filling of San Francisco Bay, and 2) to increase public access to and along the Bay shoreline. The responsibility of the Commission includes implementation of the San Francisco Bay Plan (**Appendix F**).

### ***San Francisco Bay Plan***

The San Francisco Bay Plan was adopted by the Commission in 1968 and forwarded to the California Legislature and the Governor in 1969. Reflecting years of continuous study and public deliberation, the Bay Plan contains information that describes the values associated with the Bay and policies regarding future uses of the Bay and shoreline, as well as maps that direct the protection and development of the Bay and its tributary waterways, marshes, managed wetlands, salt ponds, and shoreline in accordance with these policies.

The Plan recognizes that the Bay is a single body of water, in which changes affecting one part may also affect other parts, and should be regarded as the most valuable natural asset of the entire Bay region. Central to this idea is that the Bay benefits not only the residents of the Bay Area, but the State of California and the nation as well. This regional perspective enables the Bay Plan to effectively protect and enhance the San Francisco Bay. The San Francisco Bay Plan outlines the following policies that relate to hydrology and water quality on the project site:

### **Water Quality**

1. Bay water pollution should be prevented to the greatest extent feasible. The bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible,

restored and increased to protect and improve water quality. Fresh water inflow into the Bay should be maintained at a level adequate to protect Bay Resources and beneficial uses.

2. Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the SFBRWQCB Basin Plan.
3. New projects should be sited, designed, constructed and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into the Bay by:
  - a. Controlling pollutant sources at the project site;
  - b. Using construction materials that contain non-polluting materials; and
  - c. Applying appropriate, accepted, and effective best management practices.
6. To protect the Bay and its tributaries from the water quality impacts of nonpoint source pollution, new development should be sited and designed consistent with standards in municipal stormwater permits and state and regional stormwater management guidelines where applicable, and with the protection of Bay resources. To offset impacts from increased impervious areas and land disturbances, vegetated swales, permeable pavement materials, preservation of existing trees and vegetation, planting native vegetation and other appropriate measures should be evaluated and implemented where appropriate.
7. Whenever practicable, native vegetation buffer areas should be proved as part of a project to control pollutants from entering the Bay, and vegetation should be substituted for rock riprap, concrete, or other hard surface shoreline and bank erosion control methods where appropriate and practicable.

#### *Commission's Authority*

In conformity with the provisions and policies of both the McAteer-Petris Act and the San Francisco Bay Plan, the Commission implements its authority to issue or deny permits for proposed local projects that require placement of fill, extraction of materials, or change in the use of any land, water, or structure within the area of its jurisdiction. Thus the McAteer-Petris Act directs the Commission to carry out its regulatory process in accord with the Bay Plan policies and Bay Plan Maps.

#### *Floodplain Management*

Sections 65302, 65560, and 65800 of the California Government Code appropriates authority to local governments to adopt regulations for the protection of public health, safety, and general welfare, including protection against loss of property and life due to flooding in compliance with the NFIP. The State of California Governor's Office of Planning and Research assists local governments in floodplain management, through the development of general plan guidelines for the development of floodplain management policies and sample floodplain management municipal code ordinances.

**LOCAL REGULATORY SETTING*****Contra Costa County***

Contra Costa County has implemented stormwater quality requirements for new development within the County. The Stormwater C.3 Guidelines (C.3 Guidelines) outline the applicability to new development and the requirements for compliance. The C.3 Guidelines require developments that transform 10,000 square feet or more of pervious land into impervious surfaces to develop a Stormwater Control Plan for submission with their development application. The plan requires the applicant to design the site to minimize imperviousness, detain runoff, and infiltrate runoff where feasible. Contra Cost County has given the city of Richmond the rights to review and accept Stormwater Control Plans within the City's jurisdiction.

***City of Richmond General Plan: Open Space and Conservation Element***

The Open Space and Conservation Element of the City of Richmond (City) General Plan outlines goals and policies that address the conservation, development, and use of natural resources including water, forests, soils, rivers, and mineral deposits. **Table 3.3-1** provides the policies that are applicable to hydrology and water quality for projects within the boundaries and jurisdiction of the City of Richmond on the project site.

**TABLE 3.3-1**  
CITY OPEN SPACE AND CONSERVATION ELEMENT POLICIES

Policy	Policy Summary
OSC-I.1	Adopt flood control systems, which maintain the natural qualities of the creeks as much as possible.
OSC-I.2	Preserve streambeds, watercourses and channels in their natural state except where needed for flood and erosion control.
OSC-I.3	Control soil erosion to prevent flooding and destruction of natural waterways, to maintain water quality, to reduce public costs for flood control works, and to prevent damage to construction sites.
OSC-K.2	Restrict construction of impervious surfaces in streambeds, which are essential to groundwater recharge.
OSC- K.5	Provide for the monitoring and protection of groundwater through environmental review.
OSC- L.1	Prevent deterioration of water quality and danger to public health by requiring all new developments to hook up to existing sewage systems.

Source: City of Richmond, 1994.

***City General Plan: Safety Element***

The Safety Element of the City General Plan outlines goals and policies that address flooding hazards. **Table 3.3-2** provides a list of policies applicable to the project site.

***City Municipal Code: Excavation, Grading, and Earthwork Construction Ordinance***

Section 12.44.030 of the City Building Department Excavation Grading and Earthwork ordinance requires that a registered civil engineer for projects within the City of Richmond prepare a preliminary and final Erosion and Sediment Control Plan. The preliminary plan should define the measures to control and minimize erosion, sedimentation, and fugitive dust during the construction of the project. The final plan should include details about operational control features put in place to minimize soil erosion, maximize sediment interception, and control runoff from the project site.

**TABLE 3.3-2**  
CITY SAFETY ELEMENT POLICIES

<b>Policy</b>	<b>Policy Summary</b>
SF-C.1	Encourage the Flood Control District and require new development to install and maintain flood control measures on all creeks and watersheds in order to reduce the damage from a 100-year flood, tsunami, sea level rise, and seiches to a level acceptable to the community.
SF-C.3	Require special design features to prevent damage from flooding for all new development located within the areas subject to a special flood hazard as determined by the Federal Flood Insurance Rate Maps.
SF-C.4	Require all developments in areas prone to sea level rise to have adequate floor elevations and other site improvements that may be necessary.

Source: City of Richmond, 1994

***City Municipal Code: Flood Damage Prevention***

Section 12.56 of the City Municipal Code, Flood Damage Prevention defines flooding hazards within the City and provides general provisions and variance procedures for development within special flood hazard areas (SFHAs) depicted on the most recent updates of the FIRMs of the City. The Flood Damage Prevention Code establishes limitations and requirements for construction within a SFHA, including permitting requirements, flood proofing, and flood hazard reductions for all structures.

### 3.3.2 ENVIRONMENTAL SETTING

#### *SURFACE WATER FEATURES*

##### *Watershed*

According to the SFBRWQCB, the project site lies within the San Francisco Bay Central hydrologic planning area (Central HPA). The Central HPA surrounds the central Bay with the City along the eastern boundary, City of San Francisco along the southern boundary, and the Marin area (San Rafael, Larkspur, and Mill Valley) comprising a majority of the western boundary (**Figure 3.3-1**). Drainage in the Central HPA varies depending upon the side of the Bay. The project site is situated within the northeastern boundary of the Central HPA. Surface water runoff in the vicinity of the project site flows westward from the higher elevations of the Portero Ridge toward the Bay. There are no water resources-(streams, creeks, rivers, ponds, or lakes) designated by the SFBRWQCB within the project site, except for natural and man-made drainages forming watersheds isolated from the surrounding region that cascade down the upper elevations located on the interior of the project site discharging into the Bay. Designated Waters of the United States by the USACE are discussed in **Section 3.5**.

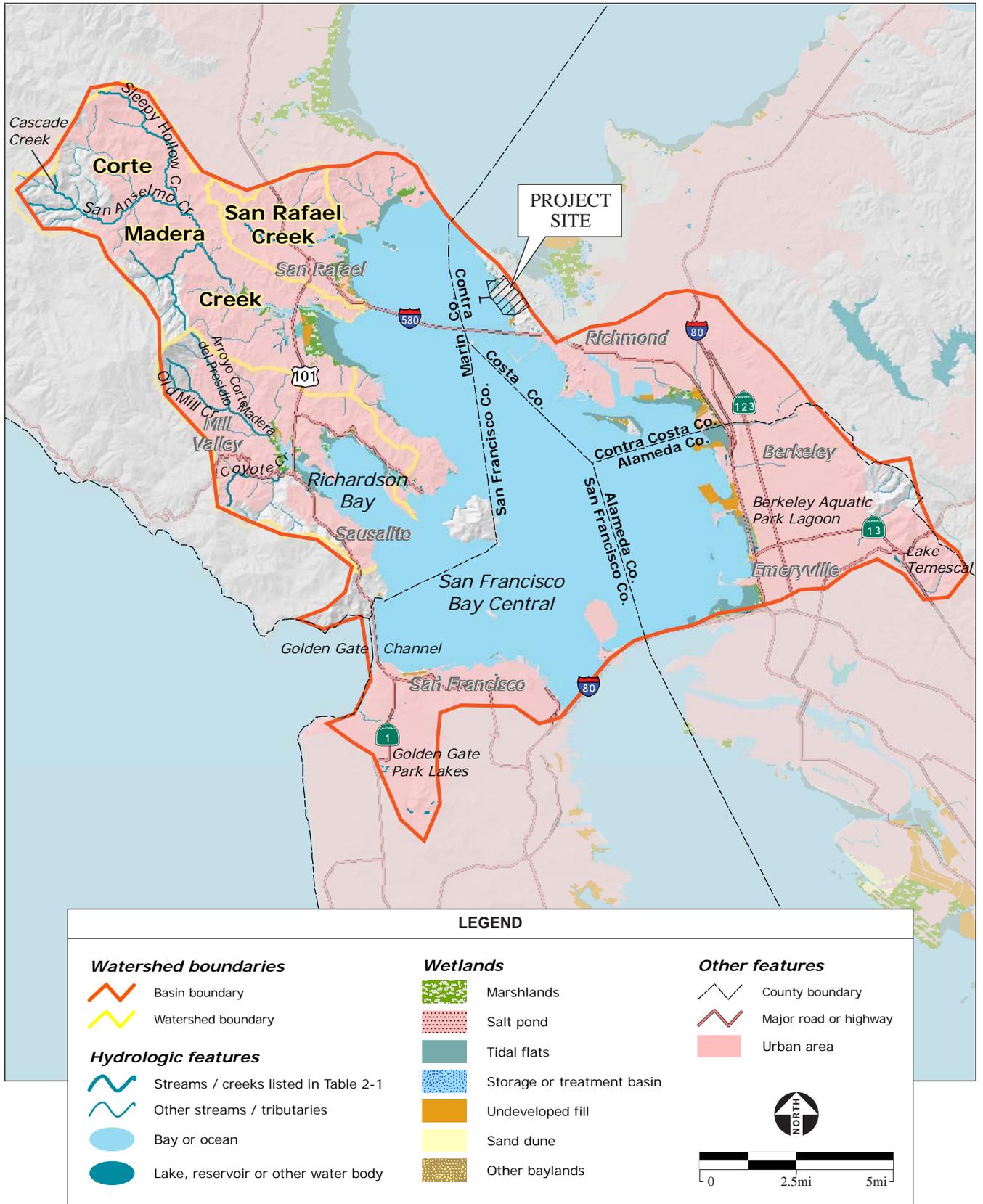
##### *Drainage*

Surface runoff from lands within the project area and lands tributary to the project area originates from the ridge located approximately one fourth to one half mile east of the western coastline. Elevation changes from approximately 400 feet at the top of the ridge to sea level. The existing landform in the eastern portions of the watersheds includes natural slopes in excess of 35 percent slope. On the western side of Western Drive the land is generally flat and contains a medium-density of industrial structures. There are eight distinct watersheds defined by the topography of the project site, varying in size from 20.4 acres to 62.5 acres. Each watershed has a separate discharge point to the Bay (**Figure 3.3-2**). The eastern portion of the each watershed is steeper upland where runoff flows over land into a system of natural channels and ravines. Drainage is diverted from the natural overland flows into culverts that discharge into the Bay. Water that falls on impermeable surfaces, such as roads and parking lots, traverses down slope as surface flow into stormwater management systems that discharge into the Bay.

The existing storm drain system on the property was designed to collect water through French drains and inlets in streets and landscaped areas. The drain system was installed in the 1940's and upgraded in 1983. The system consists of French drains, six concrete catch basins, pipe inlet headwalls, and underground concrete culverts that convey stormwater to 11 outfalls to the Bay.

##### *Tsunamis*

Tsunamis occur from seismic activity deep in the ocean floor, resulting in massive waves that penetrate deep onto shores. The project site is located within the northern inner bay of the San Francisco Bay Area and is protected from tsunamis from the northwestern peninsula of the Bay. The Association of Bay Area Governments maps tsunami evacuation areas. The project site is not located within an evacuation area.



SOURCE: San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), 2007; AES 2008

Point Molate Mixed-Use Tribal Destination Resort and Casino / 204536 ■

**Figure 3.3-1**  
San Francisco Bay Central Hydrologic Planning Area



### *Seiche*

Seiches occur when seismic action causes the water within a confined basin to undulate and ultimately top their banks. Seiche is typically an issue concerning lakes and reservoirs in seismically active areas. The Bay does not experience seiches, as it is not a confined basin and any seismic action dissipates as it travels through the bay and out towards the ocean.

### *Floodplain*

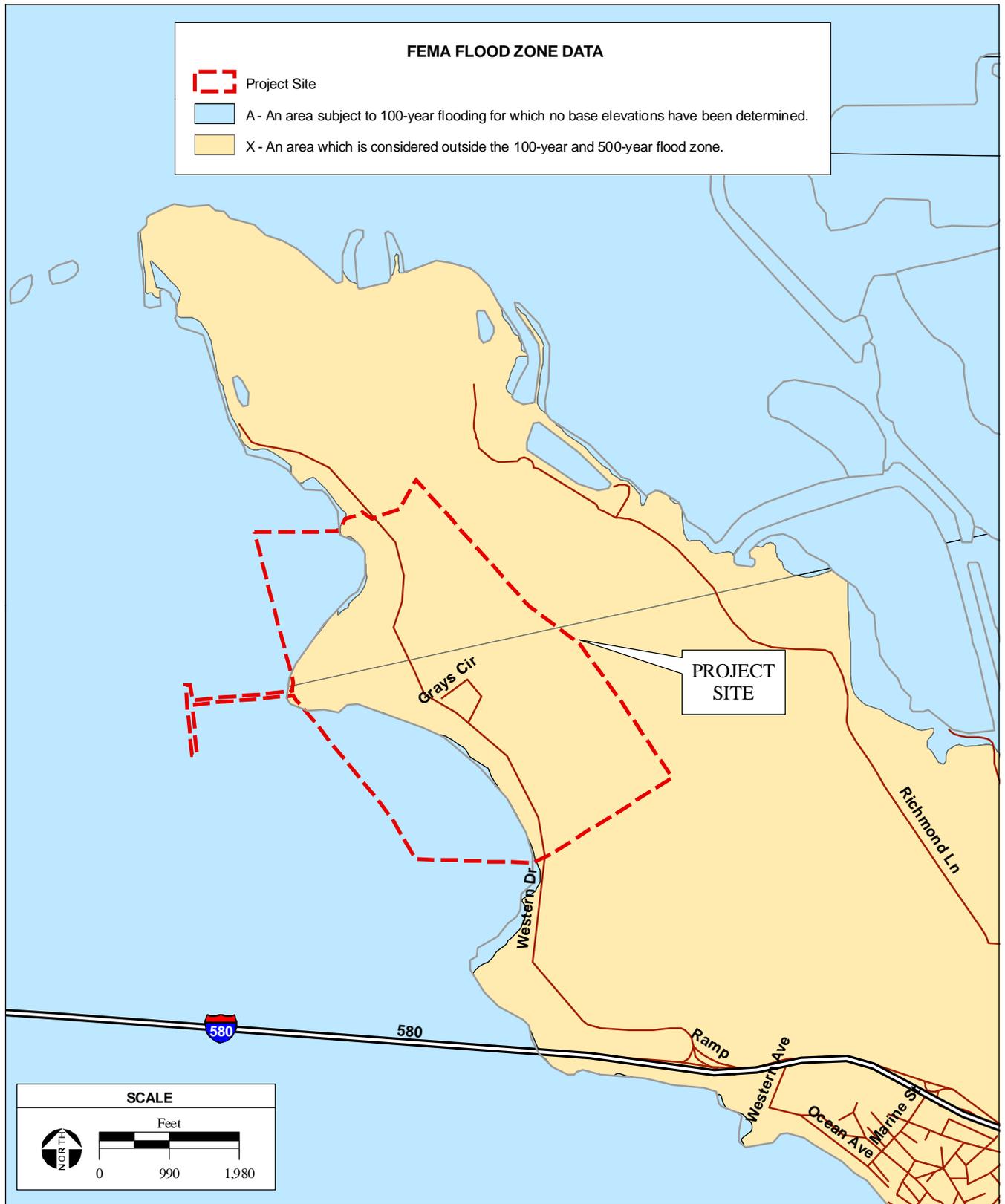
Based on the most recent update of the FIRM for the project site (September 7, 2001), no areas designated for development as shown in the site plants in **Section 2.0** are located within Zone X, which is outside of the 100- and 500-year floodplains (**Figure 3.3-3**). The project site is not located within an area prone to flooding from a potential rise in sea level of 15 inches or 55 inches as mapped by the Bay Conservation and Development District (BCDC, 2009).

### *Surface Water Quality*

Surface water quality, including quality of the Bay, is highly dependent upon stormwater quality. Upstream activities such as diking, grading, vegetation removal, and discharging of industrial/municipal wastes can degrade the quality of surface waters. Impacts to surface water quality on the project site from the remediation activities described in **Section 2.15** are discussed below, under Groundwater Quality. The Bay Area has a moderate climate similar to that found in the Mediterranean, with the majority of rain falling in the winter season between November and April. As a result, surface water quality varies seasonally.

The types of pollutants detected in surface waters vary with the type of land use in the watershed (urban, industrial, agricultural, etc.). The water quality of creeks in urbanized areas has been degraded by high levels of suspended solids; traces of contaminants associated with the operation of motor vehicles such as oil and grease, gasoline, and other hydrocarbons; lead; rubber; and other toxic substances. Nutrient wastes from sewage, agricultural fertilizers, and manure may lead to decreased dissolved oxygen levels in surface waters. Illegal and unsafe methods for disposal of hazardous wastes also pose a threat to the quality of both surface water and groundwater.

The project site does not contain surface water features, except for several ephemeral drainages that discharge stormwater runoff into the Bay. Although the SFBRWQCB has not designated beneficial uses for drainages on the project site, water quality of runoff from the site must comply with water quality ~~objectives~~ objectives outlined within the Basin Plan to protect beneficial uses of the Bay. The Basin Plan lists both narrative and numerical objectives to provide general descriptions as well as numerical baseline objectives for water quality standards. The water quality objectives for surface waters within the Bay Basin are summarized in **Table 3.3-3** and **Table 3.3-4**.



SOURCE: FEMA Q3 Flood Data, 1996; AES, 2008

Point Molate Mixed-Use Tribal Destination Resort and Casino / 204536 ■

**Figure 3.3-3**  
FEMA Flood Insurance Rate Map

Under Section 303(d) of the CWA, States periodically prepare a list of all surface waters within their boundaries for which beneficial uses of the water – such as for drinking, recreation, aquatic habitat, and industrial use – are impaired by pollutants. Such waters include estuaries, lakes, streams, and groundwater basins that fall short of state surface water quality standards, and which are not expected to improve within the next two years. States establish a priority ranking of these impaired waters for purposes of developing plans that include Total Maximum Daily Loads (TMDLs). These plans describe how an impaired water body will meet water quality standards through the use of TMDLs. A TMDL is a

**TABLE 3.3-3**  
WATER QUALITY OBJECTIVES FOR SURFACE WATERS OF THE SAN FRANCISCO BAY BASIN

<b>Constituent</b>	<b>Water Quality Objective</b>
Bacteria	See <b>Table 3.3-4</b>
Bioaccumulation	Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered.
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentration that promote aquatic growths to the extent that such growths cause nuisances or adversely affect beneficial uses.
Color	Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.
Dissolved Oxygen	For all tidal waters the following objectives apply: In the Bay: Downstream of Carquinez Bridge: 5.0 mg/l minimum. Upstream of the Carquinez Bridge: 7.0 mg/l minimum. For non-tidal waters, the following objectives apply: Coldwater habitat: 7.0 mg/l minimum. Warm water habitat: 5.0 mg/l minimum. The median dissolved oxygen concentration for any three consecutive months shall not be less than 80 percent of the dissolved oxygen content at saturation.
Floating Material	Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating of the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
Population and Community Ecology	All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce significant alterations in population or community ecology or receiving water biota.
pH	The pH shall not be depressed below 6.5 nor raised above 8.5. Controllable water quality factors shall not cause changes greater than 0.5 units in normal ambient pH levels.
Salinity	Controllable water quality factors shall not increase the total dissolved solids or salinity of waters of the State so as to adversely affect beneficial uses, particularly fish migration and estuarine habitat.
Radioactivity	Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Settleable Material	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

Constituent	Water Quality Objective
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Sulfide	All water shall be free from dissolved sulfide concentrations that cause nuisance or adversely affect beneficial uses.
Tastes and Odors	Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic municipal water supplies or to fish flesh or other edible produces of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.
Temperature	The natural receiving water temperature of inland surface waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time shall the temperature of Cold Freshwater Habitat or Warm Freshwater Habitat be increased more than 5 degrees Fahrenheit above natural receiving water temperature.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances as specified by the Regional Water Board and other appropriate agencies to evaluate compliance with this objective.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU.
Un-ionized Ammonia	The discharge of wastes shall not cause receiving waters to contain concentrations of un-ionized ammonia in excess of the following limits (in mg/l as N): Annual Median: 0.025. Maximum Central Bay and Upstream: 0.16. Maximum Lower Bay: 0.4.

Source: SFBRWQCB, 2007.

**TABLE 3.3-4**  
WATER QUALITY OBJECTIVES FOR COLIFORM BACTERIA  
IN SURFACE WATERS

Beneficial Use	Fecal Coliform (MPN/1000ML) <sup>a</sup>	Total Coliform (MPN/1000ML) <sup>a</sup>
Water Contact Recreation	Log mean < 200 90th Percentile < 400	Median < 240 no sample < 10,000
Shellfish Harvesting <sup>b</sup>	Median < 14 90th Percentile < 43	Median < 200 90th Percentile < 400
Non-Contact Water Recreation <sup>d</sup>	Log mean < 200 90th Percentile < 400	Log mean < 70 90th Percentile < 230 <sup>c</sup>
Municipal Supply: <i>Surface Water</i> <sup>e</sup> <i>Groundwater</i>	Log mean < 20 --	Log mean < 200 <1.1

Notes:

<sup>a</sup> Water quality objectives are based on the results of a minimum of five consecutive samples collected at intervals equally spaced over a 30-day period.

<sup>b</sup> From the National Shellfish Sanitation Program.

<sup>c</sup> Based on five-tube decimal dilution test or 300 MPN/100 ML when a three-tube decimal dilution test is used.

<sup>d</sup> Report of the Committee on Water Quality Criteria, National Technical Advisory Committee, 1968.

<sup>e</sup> Department of Health Service recommendations.

Source: SFBRWQCB, 2007.

calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards and an allocation of that amount to the pollutant's sources.

Currently, the SFBRWQCB is developing more than 20 projects to develop TMDLs for more than 85 303(d) listings for water bodies impaired by a variety of pollutants. When these projects are finalized and TMDLs completed, the Basin Plan would be amended to include the TMDLs as water quality objectives. Water bodies with proposed TMDL projects closest to the project site include San Pablo Creek and Wildcat Creek, located approximately 1.8 and 2.5 miles to the northeast of the project site, respectively. These waters are impaired as a result of urban runoff. The project site does not drain into either of these impacted water body tributary areas.

Due to the widespread development throughout the Bay, Stormwater discharges from residential and industrial areas are of concern in managing surface water quality within the Central HPA. Pollutants that accumulate in the dry summer months, such as oil and grease, asbestos, pesticides, and herbicides, create water quality problems due to their presence in high concentrations during the first major autumn storm event (SFBRWQCB, 2007).

#### ***GROUNDWATER***

The project site is located in the northern part of the East Bay Plain Groundwater Basin, as designated by the SFBRWQCB. In general, groundwater is found in the flatland areas with alluvial soils. In areas underlain by the clay-rich soils known as Bay Mud, the groundwater basin is shallow due to poor transmissivity of clayey soils (refer to **Section 3.2**). Groundwater flow is generally towards the Bay in an east-to-west direction. Groundwater flow direction, flow rate, and elevation are likely affected by daily and seasonal tidal and precipitation events (DWR, 2004). There are no aquifers underlying the project site capable of providing potable water in quantities available to meet the need of previous on-site development (US Navy, 2002a). Groundwater is therefore not utilized on the site as a potable water source and accordingly there are no groundwater supply wells on the project site.

#### ***Groundwater Quality***

Groundwater quality can be degraded by a variety of current and historical urban, industrial, and agricultural activities such as chemical spills, underground and aboveground storage tank leaks, landfill leachate, septic tank failures, and chemical seepage via shallow drainage wells and abandoned wells. Saltwater intrusion can also degrade the quality of aquifers. Because the groundwater basin underlying the project site is designated for municipal use, MCLs govern water quality on the project site. **Table 3.3-5** identifies additional groundwater quality objectives outlined within the Basin Plan. The project site is located in an area of historically heavy industrial activity including the Chevron – Richmond Refinery and use of the site by the U.S. Navy. Past uses of the site have led to soil, groundwater, and surface water

contamination. Currently, remediation activities, ~~including groundwater monitoring~~, are in progress to clean up areas of past contamination. Refer to **Section 3.12** for further discussion.

**TABLE 3.3-5**  
GROUNDWATER QUALITY OBJECTIVES OF THE SAN FRANCISCO BAY BASIN

<b>Central Basin</b>	
Total Dissolved Solids	Ambient or 500 mg/l, whichever is lower
Nitrate (NO <sub>3</sub> )	45 mg/l
<b>Fringe Sub-basins</b>	
Total Dissolved Solids	Ambient or 1000 mg/l, whichever is lower
Nitrate (NO <sub>3</sub> )	45 mg/l

Source: SFBRWQCB, 2007.

The project site is currently covered under the State's General NPDES Permit No. CAG912002 (Fuels General Permit) and Waste Discharge Requirement Order R2-2006-075 (Order) for the discharge of treated groundwater from the packaged groundwater treatment plant that is currently remediating groundwater at the project site (**Appendix II**). The packaged groundwater treatment plant consists of a 1,600-gallon flow control tank, four extraction wells, a 14,500 gallon bioreactor, two 2,000 pound treatment vessels (granular activated carbon) in series and three in parallel. The permit allows for the discharge of extracted and treated groundwater at a rate of 100 gallons per minute (gpm) and requires monitoring and reporting of effluent quality and discharge rate. The permit prohibits the discharge of extracted and treated groundwater from causing violations of the Basin Plan water quality standards for receiving surface water and groundwaters. To assure compliance with the Basin Plan and discharge prohibitions, the permit outlines a monitoring and reporting protocol. The protocol requires monthly, quarterly, and annual monitoring of various compounds and physical conditions of the influent (untreated extracted groundwater), effluent (treated extracted groundwater) and the receiving water (San Francisco Bay). Sampling schedule, measurements, constituents, and analysis provisions are included in Table E.2 of Appendix E of the Fuels General Permit (**Appendix II**). Monitored constituents include benzene, toluene, ethyl benzene, and toluene (BTEX) and other volatile organic compounds; total petroleum hydrocarbons; polynuclear aromatic hydrocarbons (PAHs); heavy metals (such as arsenic, chromium, lead, and mercury); and semi-volatile organic compounds. Monitoring reports are required to be prepared but only need to be submitted should a request be received from the SFBRWQCB. Furthermore, the permit holder (US Navy) has a civilly liable duty to mitigate a release that violates the Fuels General Permit and Order, should such violation result in a reasonable likelihood of adversely affecting human health or the environment.