# 4.8 HYDROLOGY AND WATER QUALITY

This chapter describes the existing water quality and hydrologic conditions within the Project area and assesses the potential impacts of the proposed Project. The analysis considers all short-term hydrologic impacts from construction and long-term impacts associated with operation of the Project. This chapter also describes potential impacts that may result from the proposed Project and identifies mitigation measures to reduce potential impacts to a less-than-significant level. Additionally, this chapter discusses both hydrology and water quality related cumulative impacts. The analyses presented in this chapter are based, in part, on a third-party peer review the following studies prepared for the Project application:

- *Preliminary Stormwater Control Plan,* BKF, September 23, 2011. See Appendix G.
- *Civil Engineering Drawings,* BKF, March 21, 2011. See Appendix E.
- *Geotechnical Exploration of The Terraces of Lafayette* prepared by ENGEO Incorporated on August 18, 2011 and revised September 2, 2011. See Appendix M.

## *A. Regulatory Framework*

This section summarizes existing local, state, and federal laws, policies, and regulations that apply to potential hydrology, water quality, and flooding impacts associated with the proposed Project.

### 1. Federal Laws and Regulations

a. Clean Water Act

Under the Clean Water Act (CWA) of 1977, the US Environmental Protection Agency (U.S. EPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The statute employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The CWA authorizes the U.S. EPA to implement water quality regulations. The National Pollutant Discharge Elimination System

(NPDES) permit program under Section 402(p) of the CWA controls water pollution by regulating stormwater discharges into the waters of the United States (U.S.). California has an approved state NPDES program. The EPA has delegated authority for water permitting to the State Water Resources Control Board (SWRCB), which has nine regional boards. The San Francisco Bay Regional Water Quality Control Board (RWQCB) regulates water quality in the Project area.

Sections 401 and 404 of the CWA are administered through the Regulatory Program of the U.S. Army Corps of Engineers (ACOE) and regulate the water quality of all discharges of fill or dredged material into waters of the United States including wetlands and intermittent stream channels. Section 401, Title 33, Section 1341 of the CWA sets forth water-quality certification requirements for "any applicant applying for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters." Work associated with ephemeral drainages and wetlands in the proposed Project area and other construction activities may require the acquisition of a permit from the ACOE under Section 404 of the CWA and water quality certification from the San Francisco Bay RWQCB under Section 401 of the CWA. Section 401 certification is required from the San Francisco Bay RWQCB prior to final issuance of Section 404 permits by the ACOE.

Section 303(d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e. not meeting one or more of the water quality standards established by the State). These waters are identified in the Section 303(d) list as waters that are polluted and need further attention to support their beneficial uses. Once the water body or segment is listed, the state is required to establish Total Maximum Daily Load (TMDL) for the pollutant causing the conditions of impairment. TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. Typically, TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The intent of the 303(d) list is to identify water bodies that require future develop-

ment of a TMDL to maintain water quality. In accordance with Section 303(d), the RWQCB has identified impaired water bodies within its jurisdiction, and the pollutant or stressor responsible for impairing the water quality. The streams in close proximity to the site (Las Trampas Creek and Reliez Creek) are not on the 303(d) impaired water bodies list. Downstream Walnut Creek is listed as impaired for diazinon, but this chemical has been banned for residential use since 2004. Therefore, the proposed development will not adversely impact any 303(d) impaired water bodies.

b. Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP), which provides subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. 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, with the minimum level of flood protection for new development set as the 100-year flood event. FEMA mapping of flood hazards for all of Contra Costa County, including Lafayette, was updated in 2009. The latest Flood Map data came into effect June 16, 2009.

c. National Pollutant Discharge Elimination System (NPDES)

Authorized by the CWA, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or manmade ditches. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. In California, the NPDES permit program is administered by the State.

**2. State Laws and Regulations**

a. Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Act of 1969 is the basic water quality control law for California. The act established the State Water Resources Con-

trol Board (SWRCB) and divided the state into nine regional basins, each under the jurisdiction of a Regional Water Quality Control Board (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. The Project site 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.

b. State Water Resources Control Board (SWRCB)

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. 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 Pesticide Regulation, the California Department of Fish and Game (CDFG) and the Office of Environmental Health and Hazard Assessment.

The SWRCB Construction General Permit (99-08-DWQ) requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) for dischargers whose projects disturb one or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres. An updated Construction General Permit (2009-0009-DWQ), adopted on September 2, 2009 and effective July 1, 2010, requires tighter stormwater pollution prevention controls, including the imposition of additional Best Management Practices (BMPs) and the development and implementation of Rain Event Action

Plans for certain sites. Construction sites that meet this criterion must submit a Notice of Intent (NOI) to file for permit coverage or else they will be in violation of the CWA.

The SWPPP must contain a site map that shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography 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.

c. San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay RWQCB adopted a Water Quality Control Plan for the San Francisco Bay Basin (the Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan.[1]

**3. Regional and Local Regulations and Policies**

a. Contra Costa Clean Water Program (CCCWP)

Together with 18 other incorporated cities in Contra Costa County, Lafayette has joined with the Contra Costa Flood Control & Water Conservation District and the County in the CCCWP initiative. Members of the program are regulated waste dischargers under an NPDES Permit issued by San Francisco Bay RWQCB, which contains requirements to prevent stormwater pollution and protect and restore creek and wetland habitat. The RWQCB recently mandated that Contra Costa County and the municipalities within the

[1] San Francisco Bay RWQCB, 2007. *Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin*, http://www.swrcb.ca.gov/rwqcb2/basin_planning.shtml, accessed on November 10, 2011.

County impose new more stringent requirements to control runoff from development projects within their jurisdiction. As part of the permitting process, Project applicants must submit a Stormwater Control Plan that describes a framework for the management of stormwater discharges.[2] Additionally, the RWQCB and CCCWP added Provision C.3, New Development and Redevelopment Performance Standards, that establishes specific thresholds and criteria for implementation of stormwater treatment measures. The CCCWP has developed a Hydromodification Management Plan (HMP) which applies to post-October 2006 projects that create 10,000 square feet or more of impervious area. The proposed Project meets this criterion. Under the HMP, a flow control standard is established so that the Project does not result in a net increase in runoff as compared to pre-project conditions. Compliance can be demonstrated by various methods; one method is to implement Best Management Practices (BMPs) using designated procedures and tools.

In compliance with C.3 requirements, the Project applicant must submit a Stormwater Control Plan (SWCP) in accordance with the CCCWP Stormwater C.3 Guidebook. The SWCP must be submitted to the City of Lafayette with the application for development. The SWCP must identify potential sources of stormwater pollutants and corresponding BMPs for each potential source. This is applicable to post-construction activities and is intended to treat runoff from the site in perpetuity. This requirement is in addition to submittal of a SWPPP for the construction phase of the Project.

b. Contra Costa County Flood Control and Water Conservation District

The mission of the Contra Costa County Flood Control and Water Conservation District (FC District) is to provide flood protection facilities while protecting environmental resources.[3] The FC District carries out its responsibility by planning and constructing the major storm drainage facilities in Flood Control Zones (entire watershed areas) and in Drainage Areas (subwa-

[2] Contra Costa Clean Water Program, http://www.cccleanwater.org/permits.html, accessed on November 10, 2011.

[3] Contra Costa County Flood Control District, http://www.co.contra-costa.ca.us/index.aspx?NID=1646, accessed on November 10, 2011.

tershed areas). The FC District collects, analyzes, and reports on rainfall and storm runoff data from a system of rain gauges and several stream flow meters.

c. Lafayette General Plan

The Lafayette General Plan contains several goals and policies that relate to hydrology and water quality. Goals and policies relevant to the Project are listed in Table 4.8-1.

d. Lafayette Municipal Code

*i. Stormwater Pollution Prevention Regulations*

Chapter 5-4 of the Lafayette Municipal Code establishes Stormwater Pollution Prevention Measures to protect and enhance the water quality of the city's watercourses, water bodies pursuant to the CWA and the Porter-Cologne Act. The regulations specify the conditions under which Provision C.3-compliant Stormwater Control Plans and SWPPPs must be prepared and implemented.

*ii. Flood Damage Prevention*

Chapter 6-18 of the Lafayette Municipal Code establishes flood damage prevention measures which seek to promote public health and safety, and to minimize losses due to flooding. Uses which pose water or erosion hazards or which result in significant increases in erosion, flood heights, or flood velocities are restricted or prohibited. Alteration of natural protective barriers to flooding such as floodplains and stream channels is controlled, as are development activities such as filling, grading and dredging. The construction of flood barriers which unnaturally divert flood waters or increase flood hazards in other areas is also closely regulated.

## *B. Existing Conditions*

### 1. Climate and Precipitation

The climate of Lafayette is categorized as warm summer Mediterranean. This climate type is characterized by pronounced seasonal changes in rainfall with

TABLE 4.8-1 **GENERAL PLAN POLICIES RELEVANT TO HYDROLOGY AND WATER QUALITY**

| Goal/Policy Number | Goal/Policy Content |
|---|---|
| *Goal OS-5* | *Preserve and protect creeks, streams, and other watercourses in their natural state.* |
| *Goal OS-6* | *Improve water quality in watercourses.* |
| Policy OS-6.1 | Reduce Watercourse Pollution: Minimize pollutants in storm water runoff. |
| Policy OS 7.1 | Control Soil Erosion: Control soil erosion to prevent flooding and landslides, maintain water quality, and reduce public costs of flood control and watercourse maintenance. |
| *Goal S-3* | *Reduce flood hazards.* |
| Policy S-3.1 | Reduce Flood Hazards: Reduce flood risk by maintaining effective flood drainage systems and regulating construction. |
| Policy S-3.2 | Flood Protection Standard: In the review of flood control for proposed new development, establish as a standard the flood recurrence intervals used by the Contra Costa County Flood Control District (e.g. the 100-year flood event for watersheds with area greater than five square miles.) |
| Policy S-3.3 Storm Drainage System | Maintain unobstructed water flow in the storm drainage system. |

Source: Lafayette General Plan, 2002, http://www.ci.lafayette.ca.us, accessed on November 10, 2011.

hot, dry summers and cooler, wet winters, but with relatively modest transitions in temperature. The City of Lafayette has average highs of 87 degrees Fahrenheit (°F) in July and August and average lows of 39°F in December and January. Average annual precipitation for the Project site is approximately 23 inches.[4] Most of the precipitation occurs between the months of October and April.

[4] Contra Costa County Public Works Department, 1977. Mean Seasonal Isohyets Compiles from Precipitation Records (1870-1973).

**2. Regional Watershed and Reservoirs**

The Project site lies within Las Trampas Creek watershed, which encompasses an area of approximately 27 square miles and is part of the larger Walnut Creek watershed.[5] Within Las Trampas Creek watershed, there are six subsidiary watersheds; the Project site is within the Reliez Creek watershed. Runoff from the Reliez Creek watershed flows into Las Trampas Creek, carrying runoff eastward toward Walnut Creek and eventually into Suisun Bay.[6] Reliez Creek is approximately ¼-mile to the east of the Project site.

There are two other large bodies of water in the vicinity of the site: the Lafayette Reservoir and the Leland Reservoir. The Lafayette Reservoir is located approximately 2.2 miles southwest of the Project site and has a capacity of 4,300 acre-feet (1.4 billion gallons). The Leland Reservoir, located ½-mile southwest of the site, is smaller in capacity (60 acre-feet), is covered, and is subject to replacement in the future.[7]

**3. Site Conditions**

The current topography of the site can be characterized as four relatively flat-lying areas (terraces) separated by slopes that vary from 1.5:1 to 4:1 (horizontal:vertical). Elevations range from a high of approximately 463 feet above mean sea level (msl) on the northernmost terrace adjacent to Deer Hill Road to a low of approximately 330 feet above msl at the drainage near Pleasant Hill Road at the eastern edge of the site. Vegetation on the Project site is dominated by a cover of non-native and native grasslands, with stands of planted and remnant native oak woodland, scattered ornamental tree plantings, and riparian woodland and scrub along the creek in the northern portion of the site.

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[5] City of Lafayette, http://www.ci.lafayette.ca.us/vertical/sites/%7BC1C49B72-3D02-4C7B-82A7-92186ABD75FF%7D/uploads/%7BC5406E06-B7E7-43C4-84DF-400DD30B55C7%7D.PDF, accessed on April 9, 2012.

[6] City of Lafayette, 2002. *Revised Draft Environmental Impact Report for Lafayette General Plan Revision.*

[7] EBMUD, 2006. EBMUD Water Treatment and Transmission Improvements Program.

**4. Drainage Features and Site Hydrology**

The Project site is located within the Suisun Hydrologic Unit. There is one ephemeral drainage that trends easterly through the northern portion of the site. A culvert crossing under Deer Hill Road directs runoff to the riparian drainage that trends east across the north portion of the site and discharges to another culvert under Pleasant Hill Road. Currently, drainage for the Project site is via overland (sheet) flow. Runoff from the site under existing conditions discharges to the concrete arch-pipe culvert described above along the northeastern edge of the site or to one of three concrete metal pipes (CMPs) located along the southern and eastern edges of the site. There also is a small seep in the south-central portion of the property that appears to pond water during brief periods of the rainy season.

A preliminary stormwater control plan (SWCP) for the proposed Project was completed by BKF in September 2011 and is provided in Appendix G.[8] A final SWCP, drainage plan, and erosion control plan would be prepared prior to the submittal of final engineering drawings and grading plan to the City of Lafayette. Prior to initiation of construction, the Project applicant would need to demonstrate that the post-development flow rates leaving the Project site do not exceed pre-development conditions. Detailed calculations regarding the size, locations, infiltration rates, detention times, and other details for the proposed bioretention areas would also be provided to show the effectiveness of the proposed drainage design.

The Preliminary SWCP identifies the site's impervious areas, which have been divided into 19 drainage management areas (DMAs). Stormwater runoff from each DMA drains to a bioretention facility, which has been sized for both flow control and treatment, in accordance with Provision C3 requirements. The treated stormwater would eventually be discharged to the existing off-site storm drain system.

[8] BKF Engineers, 2011, Preliminary Stormwater Control Plan, The Terraces at Lafayette.

### 5. Groundwater

The City of Lafayette is not located over any significant groundwater basins as identified by the San Francisco Regional Water Quality Control Board.[9] Lafayette is in the East Bay Municipal Utility District (EBMUD) service area and receives it water supply principally from the Molekumne River. According to a groundwater monitoring report for the Shell service station across Pleasant Hill Road from the site, groundwater in the area is approximately 8 to 14 feet below ground surface (bgs) with a flow direction to the east.[10]

### 6. Flooding and Dam Inundation

FEMA prepares Flood Insurance Rate Maps (FIRMs) that delineate areas at risk of inundation during 100- and 500-year flood events. There is a one percent chance of flooding each year in 100-year flood zones and these areas are considered to be at high-risk. According to FEMA Map 06013C288F, the Project site is not within the 100-year floodplain.[11] Also, the Project site is outside of the dam inundation area of both the Lafayette and Leland Reservoirs.[12]

### 7. Mudslides

The Project area ranges in elevation from approximately 330 to 463 feet. Approximately half of the Project area has a 0 to 15 percent slope.[13] Four landslides have been mapped at the site.[14] Development in the Project area is sub-

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[9] City of Lafayette, 2003. *Final Mitigated Negative Declaration, Lafayette Library and Learning Center.*

[10] Conestoga-Rovers & Associates, 2011. Groundwater Monitoring Report – Second Quarter 2011, Shell-Branded Service Station, 3255 Stanley Boulevard, Lafayette, CA.

[11] FEMA, 2009. Flood Insurance Rate Map, Contra Costa County, Map No. 06013C288F.

[12] City of Lafayette, 2010. *Downtown Lafayette Specific Plan Draft EIR*, Figure 4.7-2.

[13] BKF Engineers, 2011. *Preliminary Stormwater Control Plan.*

[14] ENGEO Inc., 2011. *Geotechnical Exploration of The Terraces of Lafayette* (Appendix M).

ject to the goals, policies, and programs in the General Plan which seek to minimize risks to Lafayette residents and property from landslides. A further discussion of these provisions is included in Chapter 4.5 of this EIR.

Landslide movement can be triggered by changes in groundwater elevation due to rainfall, saturation of soils by leaking utilities or impounded water, stream incision, fill placement, and seismic ground shaking. Landslides at the Project site can be mitigated by a combination of landslide avoidance, partial landslide debris removal and buttressing with engineered fill, and complete landslide debris removal and replacement as engineered fills. Detailed site-specific corrective grading plans and landslide mitigation measures would be prepared and reviewed as part of the final grading plans.

**8. Seiches and Tsunamis**

A seiche is a violent oscillation of the surface of a landlocked body of water, such as a lake or reservoir.[15] Usually induced by seismic events, a seiche can vary in duration from a few minutes to several hours. The Lafayette Reservoir is located approximately 2.2 miles southwest from the site and the Leland Reservoir is located about ½-mile southeast from the site. However, the Project site is outside the dam inundation zone for both of these reservoirs and would not be impacted if a seiche were to occur. The City is located more than 10 miles inland from San Francisco Bay and is therefore not at risk of tsunamis.

### *C. Standards of Significance*

The proposed Project would have a significant impact with regard to hydrology and water quality if it would:

1. Violate any water quality standards or discharge requirements.

[15] Merriam-Webster Online, "Seiche," http://m-w.com/, accessed on November 19, 2009.

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, siltation, or flooding on- or off-site.
4. 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.
5. 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.
6. 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.
7. Expose people or structures to a significant risk of inundation by seiche, tsunami, or mudflow.

### *D. Impact Discussion*

**1. Would the Project violate any water quality standards or discharge requirements.**

Urban runoff resulting from storms or nuisance flows (runoff during dry periods) from development projects can carry pollutants to receiving waters. Runoff can contain pollutants such as oil, fertilizers, pesticides, trash, soil, and animal waste. This runoff can flow directly into local streams or lakes or into storm drains and continue through pipes until it is released untreated into a local waterway and eventually the ocean. Untreated stormwater runoff de-

grades water quality in surface waters and groundwater and can affect drinking water, human health, and plant and animal habitats. Additionally, increased runoff from urban surfaces can increase the intensity of flooding and erosion.

The construction and operational phases of the proposed Project could have the potential to impact water quality. During the construction period, the proposed Project would involve grading, excavation, and cut and fill activity. Ground disturbance associated with these activities has the potential to cause erosion of exposed surfaces during rainfall events. Runoff has the potential to cause sedimentation of on-site and off-site watercourses.

Following Project construction, creation of impervious surfaces (roads, structures, walkways) and changes of local topography have the potential to alter surface runoff rates and drainage patterns from the site. Increased runoff rates and concentrated flows associated with drainage of roadways can result in the transport of sediment to downstream drainage structures. Urban runoff from roadways, driveways, and parking lots also may carry metals and petroleum-based contaminants to waterways. The following is a discussion of the potential impacts that the construction and operational phases of the proposed Project could have on water resources and quality.

a. Construction Phase Pollutant Sources

Clearing, grading, excavation, and construction activities associated with the proposed Project may impact water quality through sheet erosion of exposed soils and subsequent deposition of particles and pollutants in drainage areas. Grading activities, in particular, lead to exposed areas of loose soil and sediment stockpiles, which are susceptible to uncontrolled sheet flow. The use of materials such as fuels, solvents, and paints also presents a risk to surface water quality due to an increased potential for nonvisible pollutants entering the storm drain system.

If uncontrolled, these materials could lead to water quality impacts such as the discharge of sediment-laden runoff, prohibited non-stormwater discharg-

es, and ultimately the degradation of downstream receiving water bodies, such as Suisun Bay. The soil-disturbing activities associated with the proposed Project require the preparation and implementation of a SWPPP and related construction BMPs, with the best available technology economically achievable and best conventional pollutant control technology.

Under the NPDES General Construction Permit No. CA000037648, the Project applicant would be required to submit an NOI to the SWRCB prior to the commencement of construction activities. In addition, a SWPPP would be prepared and implemented at the Project site, and revised as necessary as administrative or physical conditions change. Prior to the issuance of a grading permit by the City, the Project applicant would be required to provide proof of filing an NOI with the SWRCB and that a SWPPP has been prepared that describes the BMPs to be implemented during the Project's construction activities. Construction contractors would be required to maintain a copy of the SWPPP at the site at all times and implement all construction BMPs identified in the SWPPP during construction activities.

The SWPPP would be required to identify construction BMPs necessary to mitigate Project impacts, including but not limited to:

- Sediment from areas disturbed by construction shall be retained onsite using structural controls (erosion and sediment controls) and sediment debris basins (first flush basin will serve this function during construction activities) to the maximum extent practicable. Streets adjacent to the site entrance and exits shall be free of sediment and debris from the Project site and shall be swept as directed by the City.
- Stockpiles of soil shall be properly contained to minimize sediment transport from the site to streets, drainage facilities, or adjacent properties via runoff, vehicle tracking, wind, or water.
- Appropriate BMPs for construction-related materials, wastes, and spills shall be implemented to minimize transport from the site to streets, drainage facilities, or adjoining properties by wind or runoff.

- Runoff from equipment and vehicle washing shall be contained at construction sites unless treated to reduce or remove sediment and other pollutants.
- All construction contractor and subcontractor personnel would be made aware of the required BMPs and good housekeeping measures for the Project site and any associated construction staging areas.
- At the end of each day of construction activity, all construction debris and waste materials shall be collected and properly disposed in trash or recycle bins.
- Construction sites shall be maintained in such a condition that an anticipated storm does not carry wastes or pollutants offsite. Discharges of material other than stormwater can occur only when necessary for performance and completion of construction practices and where they do not cause or contribute to a violation of any water quality standard; cause or threaten to cause pollution, contamination, or nuisance; or contain a hazardous substance in a quantity reportable under federal regulations (Title 40 Code of Federal Regulation [CFR], Parts 117 and 302).
- Potential pollutants include but are not limited to solid or liquid chemical spills; wastes from paints, stains, sealants, glues, limes, pesticides, herbicides, wood preservatives, and solvents; asbestos fibers, paint flakes, or stucco fragments; fuels, oils, lubricants, and hydraulic, radiator, or battery fluids; fertilizers, vehicle/equipment and concrete wash water; concrete, detergent, or floatable wastes; wastes from any engine/equipment steam cleaning or chemical degreasing; and superchlorinated potable water line flushing. During construction, the permittee shall dispose of such materials in a specified and controlled temporary area onsite, physically separated from potential stormwater runoff, with ultimate disposal in accordance with local, state, and federal requirements.
- Dewatering of non-contaminated groundwater requires a NPDES permit from the local RWQCB.
- The permittee and contractor shall inspect the erosion control work to ensure that it is in accordance with the approved plans.

- The permittee shall notify all general contractors, subcontractors, material suppliers, lessees, and property owners that dumping of chemicals into the storm drain system is prohibited.
- Equipment and workers for emergency work shall be made available at all times during the rainy season. Necessary materials shall be available onsite and stockpiled at convenient locations to facilitate rapid construction of temporary devices when rain is imminent.
- Submittal of an NOI and implementation of the SWPPP and its associated BMPs throughout the construction phase of the proposed Project would address anticipated and expected pollutants of concern as a result of construction activities. The proposed Project would comply with all applicable water quality standards and waste discharge requirements.
- The Project applicant must certify annually that construction activities are in compliance with the requirements of the General Permit and the SWPPP by filing an annual report with the SWRCB.
- The site would be visually monitored on a weekly basis and at least once each 24-hour period during extended storm events.
- A Rain Event Action Plan (REAP) must be prepared 48 hours prior to any likely precipitation event.
- A site-specific Construction Site Monitoring Program (CSMP) also would be prepared that addresses the type and frequency of visual and water quality sampling before, during, and after rain events to ensure that construction BMPs maintain their effectiveness.
- Construction activities shall be scheduled to minimize disturbed soil areas during the rainy season (October 1 through April 30) and all erosion control BMPs for sloped area shall be installed prior to the start of the rainy season.

Overall, the Project's construction activities would not result in substantial erosion, siltation, or flooding, and associated impacts would be *less than significant*.

b. Operational Phase Pollutant Sources

The operational phase of the proposed Project could result in long-term impacts to the quality of stormwater and urban runoff, subsequently impacting downstream receiving waters. Development projects can alter the existing drainage course and can potentially create new sources of runoff contamination. Consequently, the proposed Project has the potential to increase post-construction pollutant loadings of certain pollutants.

As proposed, the Project would indirectly discharge into Suisun Bay and the Pacific Ocean via the existing storm drain system. Therefore, the long-term operation of the proposed Project necessitates the implementation of post-construction or operational BMPs to mitigate and abate pollutants that may compromise the Pacific Ocean's beneficial uses and water quality. The applicable post-construction/operational BMPs for the proposed Project are discussed in the following paragraphs.

Prior to the issuance of grading permits, the Project applicant would submit a SWPPP to the SWRCB and a SWCP, hydrology/hydraulic report, grading plan, and erosion control plan to the City of Lafayette's Engineering Services Division. These reports and plans would outline approved post-construction BMPs, including site-design and source- and treatment-control BMPs selected for the Project to reduce pollutants in post-development runoff to the standards of the best available technology economically achievable and the best conventional pollutant control technology. In addition, a Storm Water Control Operation and Maintenance (O&M) Plan would be submitted to the City and an Operations and Maintenance Agreement would be recorded prior to issuance of a building permit. The property owner would incorporate through the Homeowner's Association (HOA) fees a financial mechanism to ensure that the BMPs would be maintained in perpetuity. Potential site-design, source-control, and treatment-control BMPs that would be incorporated into the proposed Project are described in the following paragraphs.

There are several low impact development (LID) strategies for managing run-off from buildings and pavement. The following site-design BMPs would be incorporated into the Project:

- Optimize site layout by preserving natural drainage features to the extent feasible and design buildings and circulation to minimize the amount of roofs and paving.
- Preserve existing native trees and shrubs to the extent possible and plant additional native or drought tolerant trees and large shrubs.
- Use natural drainage systems to the maximum extent practicable.
- Plant native or drought-tolerant vegetation on slopes.
- Use energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels.
- Design interior roadways and sidewalks to the minimum required widths to minimize impervious surfaces.
- Disperse runoff from impervious surfaces to adjacent pervious surfaces, such as directing roof downspout to disperse runoff to landscaped area), to the extent feasible.
- Drain impervious surfaces to engineered Integrated Management Practices (IMPs) such as bioretention areas.

Source control BMPs effectively minimize the potential for typical urban pollutants to come into contact with stormwater, thereby limiting water quality impacts downstream. Numerous source-control BMPs would be incorporated into the proposed Project and would be carried out through its operation phase. These include:

- Storm drain stenciling or signage on all catch basins with highly visible source-control messages (e.g. “No Dumping—Drains to Bay”).
- Regular litter control for the entire Project area, including trash pick up and sweeping of littered common areas, performed by the maintenance crew.

- Sweeping of all impervious surfaces (interior streets, sidewalks, and parking areas) at a frequency that reduces or prevents sediment and debris from entering receiving waters and prior to the rainy season.
- Properly designed trash enclosures and material storage areas to minimize contact with stormwater and reduce rainfall runoff.
- Proper landscaping design incorporating native drought-tolerant plants, protection of slopes, and efficient irrigation design.
- Routine maintenance of all catch basins, grate inlets, etc., for debris and litter removal.
- Common-area landscape management that includes minimizing fertilizer and pesticide application, maintenance activities, and proper education and training for landscaping/maintenance workers.

Treatment-control BMPs remove anticipated pollutants of concern from on-site runoff. They can range from natural treatment systems such as vegetated swales, detention basins, and constructed wetlands, to proprietary control measures.

Based on the Project drainage and hydrologic conditions, onsite bioretention basins have been proposed that would meet the treatment-control BMP requirements and the Provision C.3 flow-control (hydromodification) requirements. The 18 proposed bioretention areas (IMPs) for the Project would be located adjacent to and behind buildings and roads in flat areas of the site. The basins are designed to provide preliminary treatment through the settling of sediments and equalize flows prior to discharge into the existing off-site storm drain system. Drainage from sloped areas would be collected in earthen ditches lined with jute netting that would ultimately connect to on-site storm drain pipes and ultimate discharge into the existing off-site storm drain system.

Collectively, the site-design and source- and treatment-control Project design features would address the anticipated and expected pollutants of concern from the operational phase of the proposed Project. Additionally, through

the development review process, the City would ensure that the Project complies with various statutory requirements necessary to achieve regional water quality objectives and protect groundwater and surface waters from pollution by contaminated stormwater runoff. Stormwater runoff generated on the Project site would be managed in accordance with all applicable federal, state, and local water quality rules and regulations in order to effectively minimize the Project's impacts on water quality. With implementation of these measures, the Project impact would be *less than significant*.

2. **Would the Project 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 an increase in impervious surfaces. Impervious surfaces prevent the infiltration of runoff into the underlying soil and can interfere with groundwater recharge. However, the Project is not located over any significant groundwater basin as identified by the San Francisco Regional Water Quality Control Board. Lafayette is in the East Bay Municipal Utility District (EBMUD) service area and receives its water supply principally from surface water and the Molekumne River. Implementation of the Project would not use groundwater for irrigation or drinking water and therefore would not deplete groundwater or interfere with its recharge. If groundwater dewatering is required as part of the Project construction and would be discharged offsite to a storm drain or receiving water body, a site-specific NPDES dewatering permit would be obtained from the San Francisco Bay RWQCB and a Waste Discharge Authorization (WDA) would be issued to the Project contractor. Project impacts with respect to groundwater would be *less than significant*.

3. **Would the Project 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 run-**

**off in a manner which would result in substantial erosion, siltation or flooding on- or off-site**

Implementation of the proposed Project would require grading to create the building pads, to construct the on-site roadways, and for installation of utilities. If not controlled, the transport of loose soils to local waterways would temporarily increase suspended sediment concentrations and release pollutants attached to sediment particles. Also, sediment can accumulate at downstream storm drain inlets and reduce capacity. As previously stated, the Project would be required to submit an NOI, SWPPP, and erosion control plan prior to the commencement of construction activities. The SWPPP and erosion control plan would describe the BMPs to be implemented during the Project's construction activities to minimize construction-related erosion impacts.

Project development would result in an increase in impervious surfaces, which could result in increases in peak runoff rates at downstream drainage facilities and could potentially create downstream drainage and erosion problems. The Project applicant has proposed a complex on-site drainage control and detention system to ensure that off-site runoff rates and volumes do not exceed pre-development levels. As described in the Preliminary SWCP, the proposed Project includes the construction of 18 bioretention areas or IMPs adjacent to buildings and roads. In addition, drainage from sloped landscape areas would be collected in earthen ditches lined with jute netting and eventually discharged to the on-site storm drain system. To comply with the CCCWP's Hydromodification Management Plan (HMP), the Project's IMPs have been designed in accordance with the program's LID site design procedures and facility sizing tools, as defined in the Stormwater C.3 guidebook. These design elements would reduce the potential for increased runoff.

Because the native clayey site soils have relatively low permeabilities, the bioretention areas have been designed with engineered soils and perforated pipe subdrains that connect to the storm drain system. The size, capacity, and location of the 18 bioretention areas and the supporting calculations are provided in the Preliminary SWCP, which can be found in Appendix G. The

basins are designed to attenuate the flow from a 10-year storm to pre-development levels.

Additional hydrologic analyses and detailed system design specifications would be provided to the City prior to the issuance of grading permits. Also, a Storm Water Control Operation & Maintenance Plan would be prepared for review by the City and a Stormwater Management Facility Operation and Maintenance Agreement would be signed indicating the property owner would accept responsibility for the operation and maintenance of the storm-water facilities in perpetuity. Project impacts would be *significant*.

**4. Would the Project 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**

Project development would increase the impervious surface at the site and could result in an increase in peak runoff at downstream drainage facilities. Net surface runoff volumes leaving the site are unlikely to change substantially as a result of the installation of 18 bioretention areas, which would treat runoff so that downstream pollution potential is minimized. Planned detention ponds would be designed to contain site drainage flows from 10-year runoff events such that downstream drainage systems are not impacted by the proposed development. There are currently no significant deficiencies in the existing off-site storm drain system in the vicinity of the Project site. However, site drainage flows from 10-year and 100-year storm events may not be safely conveyed through the existing off-site storm drain system. Therefore, construction of the Project could result in a *significant* impact.

**5. Would the Project 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**

The Federal Emergency Management Agency (FEMA) publishes maps that show areas of flood risk throughout the United States. The FEMA map for

the Project area[16] shows that the site is not within the 100-year or 500-year flood zone. Therefore, implementation of the Project would not expose people or structures to risks associated with a 100-year flood event, and there would be *no impact*.

**6. Would the Project 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.**

As discussed previously, the Project site is not within a 100-year floodplain. There are two reservoirs in close proximity of the site: the Lafayette Reservoir, which is about 2.2 miles to the southwest, and the Leland Reservoir, which is approximately 0.5 mile to the southeast. However, the Project site is outside of the dam inundation zones for these reservoirs. Because the site is elevated, the risk for flooding is further reduced. Therefore, there would be *no impact.*

**7. Would the Project expose people or structures to a significant risk of inundation by seiche, tsunami, or mudflow**

Lafayette is located more than 10 miles inland from San Francisco Bay and therefore would not be impacted by tsunamis. Similarly, because the Project site is outside of dam inundation zones of Lafayette Reservoir and Leland Reservoir and there are no other large bodies of water in the area, there is no risk of inundation due to seiches.

However, because the Project site is located on a hillside that is susceptible to landslides, there is a potential for mudflows. A detailed geotechnical study would be prepared that maps the locations of former landslides at the site and proposes possible mitigation measures: 1) avoidance of landslide areas, 2) partial landslide debris removal and buttressing with engineered fill, or 3) complete landslide debris removal and replacement as engineered fill. Similarly, the detailed geotechnical study would include a discussion of slope stability with site-specific analyses for graded slopes, maximum slope inclinations, and

[16] *Flood Insurance Rate Map (FIRM) Map No. 06013C288F*

detailed recommendations for corrective design measures. Project impacts associated with mudflows would be *less than significant* with implantation of Mitigation Measure GEO-1 identified in Chapter 4.5.

**8. Cumulative Impacts**

Implementation of the proposed Project, in conjunction with planned future projects in the vicinity of the site identified in Table 4-1 in Chapter 4, could result in short-term construction-related impacts and long-term operational impacts to water quality or increase stormwater runoff or erosion. The impacts of the proposed Project with respect to surface runoff and groundwater are predicted to be minimal, but would incrementally contribute to the increase in stormwater runoff and pollutant loading to the nearby storm drains. As with the proposed Project, related future projects in the City of Lafayette would be required to comply with drainage and grading regulations and ordinances that control runoff and regulate water quality at each development site. New projects would be required to demonstrate that stormwater volumes could be managed by downstream conveyance facilities and would not induce flooding. New projects in Lafayette also would be required to comply with the City's standard conditions of approval, regulations, and ordinances regarding water quality and NPDES permitting requirements. In combination with other reasonably foreseeable development in Lafayette, the proposed Project would result in a *less-than-significant* impact with respect to hydrology and water quality.

### *E. Impacts and Mitigation Measures*

**Impact HYDRO-1**: Following Project construction, creation of impervious surfaces (roads, structures, walkways) and slight changes of local topography has the potential to alter surface runoff rates and drainage patterns from the site and increase surface runoff rates, peak flows, and sediment transport downstream.

Mitigation Measure HYDRO-1a: Prior to the issuance of grading permits, additional hydrologic analyses and detailed drainage design drawings for the bioretention basins shall be submitted in a Final Stormwater Control Plan to the City for review and approval. The analyses shall include:

- 10-year peak flows.
- Comparison of post-development peak flow rates and volumes to pre- development conditions.
- Final calculations providing size, capacity, location, and infiltration rates for the 18 proposed bioretention basins.
- On-site storm drain system piping layout and pipe size calculations.

Mitigation Measure HYDRO-1b: An Operation and Maintenance (O&M) Plan and Schedule shall be prepared as part of the Final Stormwater Control Plan and submitted to the City of Lafayette. The property owner (or Homeowners Association) shall enter into a standard stormwater O&M agreement with the City, codifying their responsibility for O&M performance and reporting. An O&M Manual shall be prepared and submitted to the City prior to the issuance of grading permits. The O&M Manual shall specify that the design storage capacity of the basins will be maintained and that accumulated residual sediment and other material will be cleaned out. The detention basins shall be inspected at least once per year prior to the start of the rainy season and debris removal shall occur on an as needed basis.

Significance after Mitigation: *Less than Significant.*

**Impact HYDRO-2**: Project development would increase the impervious surface at the site and could result in an increase in peak runoff at downstream drainage facilities.

Mitigation Measure HYDRO-2: As part of the Final Stormwater Control Plan, the Project applicant shall provide to the City an analysis that

shows the peak discharge from the Project site for the 10-year and 100-year storm and demonstrate that this discharge can be safely conveyed through the existing off-site storm drain system. The condition of the downstream conveyance system shall be investigated to confirm that the capacity of the existing system is sufficient to meet existing and Project-related demands.

Significance after Mitigation: *Less than Significant.*