3.7 HYDROLOGY AND WATER QUALITY

3.7.1 INTRODUCTION

This section of the draft environmental impact report (EIR) examines the proposed project to determine if it would directly or indirectly affect the hydrology and water quality of the project site and region. The hydrologic conditions examined include drainage patterns, surface flow, flooding, water quality, and groundwater recharge. This section of the draft EIR is based on information gathered from the *City of Hercules General Plan* (1998); the City of Hercules, California; Mare Island 7.5-minute United States Geological Survey (USGS) Topographic Quadrangle; and various other sources as documented in this section.

3.7.2 ENVIRONMENTAL SETTING

3.7.2.1 Regional Hydrology

The City of Hercules is located in the Contra Costa County Watershed Management Area, which is one of eight counties that are located in the San Francisco Bay Hydrologic Region (HR). The San Francisco HR encompasses approximately 2.88 million acres (4,500 square miles). Characteristics of the region include significant geological features and sensitive habitat areas located in close proximity to densely populated urban centers. Regionally significant geologic features of the San Francisco Bay HR that influence drainage and hydrology are the valleys of Santa Clara, Napa, Petaluma, Livermore, Sonoma, and Suisun-Fairfield; the peninsulas of Marin and San Francisco; the bays of San Francisco, San Pablo, and Suisun; the mountain ranges of Santa Cruz, Diablo, Bolinas Ridge; and the Vaca Mountains of the Coast Range.

The Contra Costa County Watershed Management Area (CCCWMA) can be further defined as being located within National Hydrography Dataset (NHD) 1805002. The NHD is a USGS database that contains geospatial information about the nation's surface water. An NHD includes hydrologic surface water features such as the watershed boundary, water bodies, watercourses, and water basins/subbasins. The CCCWMA contains 17 municipalities and unincorporated County territory within the limits of this watershed. The City of Hercules is one of these municipalities.

The CCCWMA contains 800 square miles of area with a population of 962,900 (Census 2000). Around the 1940s, the County underwent a trend of increased urbanization. Development of industrial uses in the Contra Costa County region has contributed to a disproportionately large amount of industrial discharge because the County has the largest number of municipal and industrial dischargers in the region.

The CCCWMA is further subdivided into three geographic areas within the watershed area boundary. These geographic areas are the West, Central, and East counties. The City of Hercules is located within the West County portion of the CCCWMA. The West County portion of the watershed contains 27 percent of the urbanized land in the County and is composed of residential, commercial, and industrial uses. "Dirty" industrial uses such as the former Hercules Powder Works were established in this area, including petroleum refineries and chemical companies. The major watercourses that traverse this watershed are Wildcat Creek and San Pablo Creek, which both discharge to San Pablo Bay.

3.7.2.2 Local Hydrology

The City of Hercules lies along the shores of San Pablo Bay. The bay and its associated tributaries are the major hydrological features of Hercules. Refugio Creek is the most prominent watercourse network that traverses the City.

Sycamore Crossing

The West Branch of Refugio Creek bisects the Sycamore Crossing site and provides drainage for the majority of the site. The west branch is a low-volume stream with a cobble and gravel substrate that flows east and north through the Sycamore Crossing site and maintains intermittent surface connection with Refugio Creek. The stream supports a narrow band of associated riparian vegetation. The southern end of the waterway appears to have been channelized into a ditch and is bordered by a fence and eucalyptus trees.

Stormwater on site flows as sheet flow into either the West Branch of Refugio Creek or into the storm drain systems of the surrounding roadways. Both Refugio Creek and the local storm drain system empty into San Pablo Bay.

Hill Town

While not associated with any natural drainage course, the Hill Town site contains two detainment ponds on the southern end of the property that total approximately 3.9 acres. The ponds were originally used in the operation of the industrial facility and may have been periodically filled and drained. Additionally, a freshwater emergent wetland covers approximately 0.4 acre at the extreme southern edge of the Hill Town property and is characterized by a seasonal swale that drains into a culvert, which crosses San Pablo Avenue and drains into Refugio Creek. Like the Sycamore Crossing site, stormwater on the Hill Town site ultimately drains to San Pablo Bay.

3.7.2.3 Groundwater

The City of Hercules lies within the San Francisco Bay Hydrologic Region. However, due to low elevations, proximity to San Pablo Bay, and the underlying bedrock, Hercules and the surrounding communities are not within a groundwater basin identified by the California Department of Water Resources.[1] Groundwater in the Refugio Valley is expected to occur at shallow depths and is not a source of potable water.

3.7.2.4 Floodplains

Sycamore Crossing

The West Branch of Refugio Creek bisects the parcel on the southeast section. The banks adjacent to this portion of the site are located within the Federal Emergency Management Agency's (FEMA's) A1 flood zone, according to the Flood Insurance Rate Map (FIRM) County Panel 060434 0008B, for the City of Hercules in Contra Costa County, (effective date September 30, 1982) (**see Figure 3.7-1, FEMA FIRM Map of 100-year Flood Zones in the Added Area**). The A1 designation means that this area has a 1 percent chance or greater to be flooded each year (i.e., within the 100-year floodplain).

Hill Town

The Hill Town site is not within the 100-year floodplain (see **Figure 3.7-1**).

3.7.3 REGULATORY FRAMEWORK

This section describes the local, state, and federal regulatory context to be considered for the proposed project.

3.7.3.1 Federal Regulations

Federal Pollution Control Act

The Federal Pollution Control Act, commonly known as the Clean Water Act (CWA), was originally enacted in 1948. The primary purpose of the act is to restore and maintaining the chemical, physical, and biological integrity of the nation's water in order to achieve a level of water quality that provides for recreation in and on the water and the propagation of fish and wildlife. Section 208 of the CWA and the requirements of the *Code of Federal Regulations* require local water management plans. Preparation of these water management plans has been delegated to the individual states by the US EPA, which is charged with implementing the CWA.

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1 California, State of. Department of Water Resources. Bulletin 118, updated in 2003.

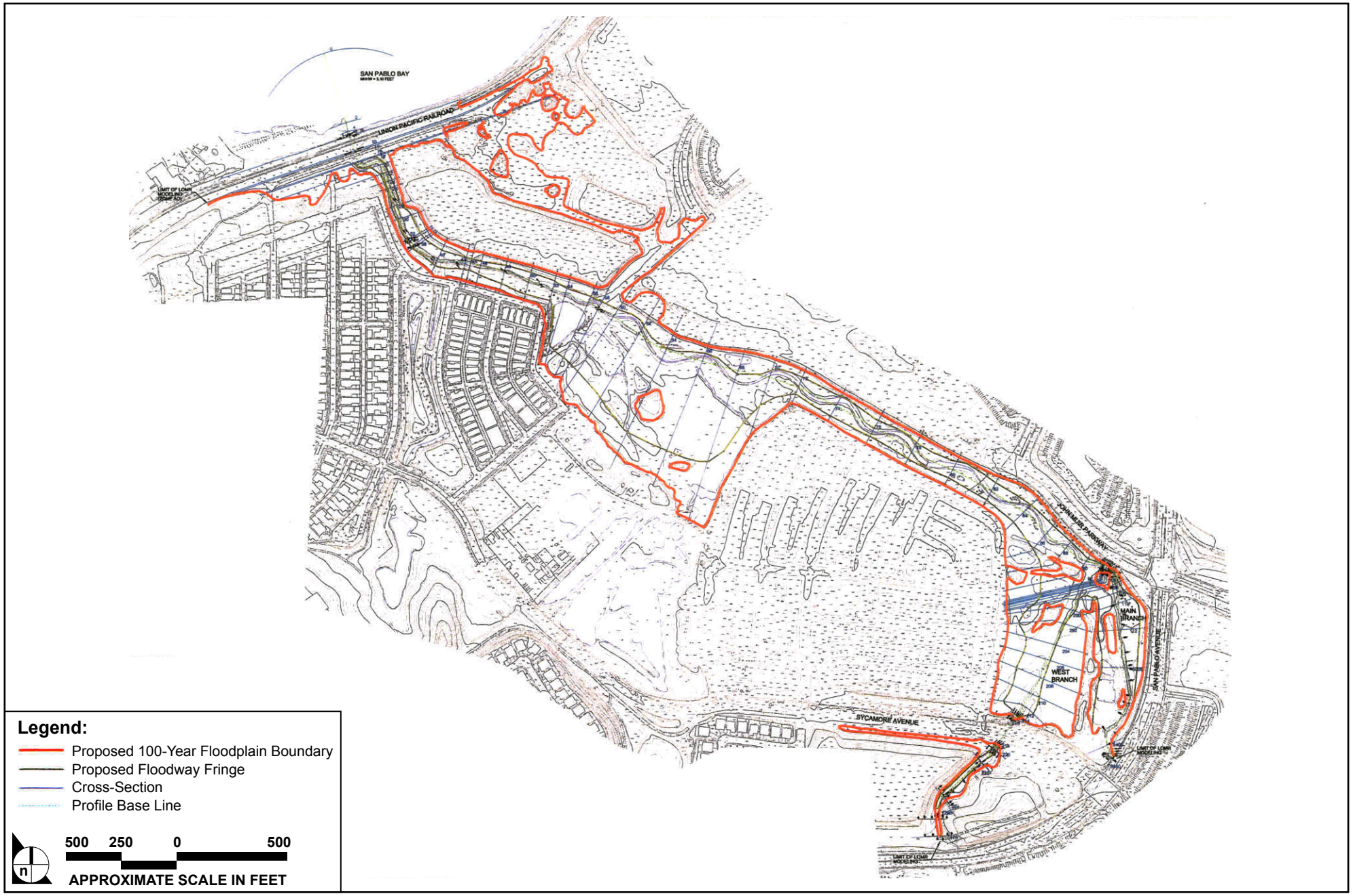
The project site is located within the southern portion of the 2.9-million-acre San Francisco Bay Basin, which is governed by the San Francisco Bay (Region 2) RWQCB. The San Francisco Bay RWQCB has adopted a basin plan in accordance with criteria contained in the California Porter-Cologne Water Quality Control Act, the CWA, and other pertinent state and federal rules and regulations. The intent of the basin plan is to provide definitive guidelines and give direction to the scope of San Francisco Bay RWQCB activities that will optimize the beneficial uses of the state waters within the San Francisco Bay Basin by preserving and protecting the quality of these waters. The intended beneficial use of water determines the water quality objectives. For example, drinking water has to be of higher quality than the water used to irrigate pastures. Both are beneficial water uses, but the quality requirements for irrigation water are different from those for drinking water.

The San Francisco Bay RWQCB implements the Basin Plan by issuing and enforcing waste discharge requirements for appropriate persons and groups; these can include individuals, communities, or businesses whose waste discharges may affect water quality. These requirements can be either State Waste Discharge Requirements for discharge to land, or federally delegated National Pollutant Discharge Elimination System (NPDES) permits for discharges to surface water. Dischargers are required to meet water quality objectives and, thus, protect beneficial uses. Two types of approvals must be obtained from the San Francisco Bay RWQCB for this project, including coverage under the General Construction Permit and NPDES Permit No. CAS0299718. Additional information regarding these approvals is summarized below under subsection **National Pollutant Discharge Elimination System**.

3.7.3.2 California Regulations

Total Maximum Daily Load – Section 303(d) of the Clean Water Act

The State of California is required by Section 303(d) of the CWA to provide the US EPA with a list of water bodies considered by the state to be impaired (i.e., not meeting water quality standards and not supporting their beneficial uses). The list also identifies the pollutant or stressor causing impairment, and establishes a schedule for developing a control plan to address the impairment, typically a total maximum daily load (TMDL). The TMDL specifies the amount of the target pollutant that the water body can sustain on a daily or annual basis and is established by amending the water quality control plan. TMDLs are prepared by the RWQCBs and result in amendments to WQCP, which must be approved by the US EPA. The 303(d) list is used by the US EPA to prepare the biennial federal CWA Section 305(b) Report on Water Quality. Refugio Creek is not included on the 2006 303(d) list. The area of the San Francisco Bay that receives stormwater runoff from the project site, San Pablo Bay, is included on the 303(d) list for several contaminants including pesticides, metals, and polychlorinated biphenyls (PCBs).



SOURCE: Balance Hydrologies, Inc. - December 2004

FIGURE **3.7-1**

FEMA FIRM Map of 100-year Flood Zones in the Added Area

359-011•01/09

California Porter-Cologne Act

The Porter Cologne Act of 1970 is largely responsible for creating the state's extensive regulatory program for water pollution control. As discussed above, preparation of water management plans has been delegated to the individual states by the US EPA. Pursuant to the Porter-Cologne Act, the responsibility for protection of water quality in California rests with the State Water Resources Control Board (SWRCB). The SWRCB in turn has delegated the regulation of the hydrologic basin to nine RWQCBs to regulate the nine hydrologic basins in the state. The Porter-Cologne Act gives the SWRCB and RWQCBs broad powers to protect water quality by regulating waste discharges to water and land and by requiring cleanup of hazardous conditions.

EPA California Toxics Rule

The US EPA has developed water quality criteria for priority toxic pollutants and other provisions for water quality standards to be applied to inland surface waters, enclosed bays, and estuaries in the State of California. This rule was developed to address a gap in California's water quality standards that was created when the state's water quality control plans containing water quality criteria for priority toxic pollutants were overturned in 1994. The established numerical standards were deemed necessary to protect human health and the environment. The rule includes ambient aquatic life criteria for 23 priority toxic pollutants, ambient human health criteria for 57 priority toxics, and a compliance schedule.

National Pollutant Discharge Elimination System

The US EPA has delegated management of California's NPDES program to the SWRCB and the nine regional board offices. The NPDES program was established in 1972 to regulate the quality of effluent discharged from easily detected point sources of pollution such as wastewater treatment plants and industrial discharges. The 1987 amendments to the CWA (Section 402[p]) recognized the need to address nonpoint source stormwater runoff pollution and expanded the NPDES program to operators of municipal separate storm sewer systems (MS4s), construction projects, and industrial facilities.

Construction

The SWRCB administers the NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit). A notice of intent must be submitted to the SWRCB prior to the beginning of construction for projects disturbing 1 acre or more of land to be covered under the General Construction Permit. The General Construction Permit requires that a stormwater pollution prevention plan (SWPPP) be developed, identifying potential sources of pollution and specifying runoff controls during construction for the purpose of minimizing the discharge of pollutants

in stormwater from the construction area. In addition, the SWPPP must identify post-construction control measures and a monitoring plan.

Municipal

Contra Costa County Flood Control and Water Conservation District, Contra Costa County, and 16 incorporated cities in the County, including the City of Hercules, participate in a joint MS4 (NPDES Permit No. CA0029912) issued by the San Francisco RWQCB. This MS4 permit establishes the Stormwater Management Plan (SWMP) for the Contra Costa Clean Water Program. The plan strives to protect the beneficial uses of receiving waters, which are identified by the San Francisco Basin Plan for the Bay and tributary waters as

- contact and non-contact water recreation
- wildlife and estuarine habitat
- preservation of Rare and Endangered species
- navigation
- fish spawning and migration
- shellfish harvesting
- industrial service and process supply
- groundwater recharge
- commercial and sport fishing
- municipal water supply
- warm and cold freshwater habitat
- freshwater replenishment

3.7.3.3 Local Plans and Policies

Bay Area Joint Aquatic Resources Permit Application (JARPA)

Bay Area Joint Aquatic Resources Permit Application (JARPA) is a simplified permit application for development activities in or near aquatic environments in the Bay Area. JARPA is administered by the Association of Bay Area Governments (ABAG). The JARPA permit application addresses work in, over, or on a stream, wetland, bay, or any other water body deemed "waters of the state" or "waters of the US"

Coverage under this joint permit would replace coverage under individual permits from the BCDC, California Department of Fish and Game (CDFG), SWRCB, and RWQCB (including CWA Section 401 certification and Waste Discharge Requirements), as well as coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (General Permit).

City of Hercules General Plan

The *City of Hercules General Plan* identifies the following programs and measures to protect people and development from flooding:

Land Use Element

Program 13B: Design of the flood control improvements along Refugio Creek should be done in a manner to function as a transition area between land uses.

Growth Management Element

Performance Standard III.E.7: All new structures shall be located outside the Flood Zones A and B as designated by the Flood Insurance Rate Maps; or insure that the finished floor elevation is at least one foot above the flood elevation as determined by FEMA. Development of any property shall not significantly increase the flooding potential at downstream areas, or otherwise significantly impact or aggravate a flooding problem at downstream properties.

Seismic Safety/Safety Element

Policy C.2.e.1: Refugio Creek Channel should be improved for existing drainage so that adequate capacity for expected flood flow is provided.

Policy C.2.e.2: The City should develop ordinances and enforcement mechanisms which preserve, develop and maintain drainage courses.

Policy C.2.e.3: Review of any significant project proposals for areas which are not presently in flood zones should include an evaluation of increased downstream flows resulting from the project.

Policy C.2.e.4: Finished floor elevation of all developments must be one foot above the 100-year flood elevations prescribed on the Flood Insurance Rate Map.

Policy C.2.e.5: In order to protect lives and property, intensive development should not be permitted in reclaimed areas unless flood protection in such areas is constructed to the standards of the Flood Disaster Protection Act of 1973.

3.7.4 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines*, the proposed project would have a significant impact on hydrology or water quality if it would

- place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam;
- 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;
- violate any water quality standards or waste discharge requirements;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- substantially alter the drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- otherwise substantially degrade water quality;
- 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; or
- cause inundation by seiche, tsunami, or mudflow.

3.7.5 IMPACTS AND MITIGATION MEASURES

3.7.5.1 Issues Not Discussed Further

The City of Hercules lies within the San Francisco Bay Hydrologic Region. However, due to low elevations, proximity to San Pablo Bay, and the underlying bedrock, Hercules and the surrounding communities are not within a groundwater basin identified by the California Department of Water Resources.[2] Groundwater in the Refugio Valley is expected to occur at shallow depths and is not a source of commercially potable water.

The proposed Updated 2009 Redevelopment Plan and potential future development of the proposed project sites would reduce percolation by installing impermeable surfaces. However, since the proposed project sites are not within an identified groundwater basin, nor in an area that is a significant source of groundwater recharge, the proposed project would have no impact on groundwater supplies or groundwater recharge.

The Added Area of the proposed project is located outside of the San Francisco Bay tsunami evacuation area and would, therefore, not be subject to inundation by a tsunami. The Added Area is not located in an area that would be subject to inundation by failure of a levee or a dam. Additionally, it is not located near a large body of water that would be capable of creating a seiche, nor is it located near unstable hilly terrain that could cause a mudflow.

3.7.5.2 Project Impacts

Impact Hyd-1: **The proposed project would generate water pollutants, both as a result of construction activities and from urban stormwater runoff. However, compliance with all NPDES and SWMP requirements would ensure that water pollutants generated on site would remain at less than significant levels. *(Less than Significant).***

Section 303 of the federal Clean Water Act requires states to develop water quality standards to protect the beneficial uses of receiving waters. In accordance with California's Porter-Cologne Act, RWQCBs are required to develop water quality objectives that ensure their region meets the requirements of Section 303 of the Clean Water Act. The City of Hercules is within the jurisdiction of the San Francisco RWQCB.

NPDES (Section 402 of the Clean Water Act) was established to achieve the water quality objectives. Pursuant to the NPDES, municipalities are required to obtain permits for the water pollution generated

2 California, State of. Department of Water Resources. Bulletin 118, updated in 2003.

by stormwater in their jurisdiction. These permits are known as Municipal Separate Storm Sewer Systems (MS4) permits.

As described above under regulatory framework, the City of Hercules participates in a joint MS4 issued by the San Francisco RWQCB. This MS4 permit establishes the Stormwater Management Plan (SWMP) for the Contra Costa Clean Water Program. The SWMP incorporates performance standards, also referred to as BMPs (best management practices), that are intended to define the level of implementation necessary to demonstrate the reduction of pollutants in stormwater to the maximum extent practicable. It also includes water quality requirements for new development and construction.

Hercules adopted the SWMP via its Grading and Stormwater Ordinance. Development projects in the City are required to comply with the SWMP's performance standards and other requirements for new development and construction, which include the use of structural and non-structural BMPs.

The project would establish the land use framework and potentially provide redevelopment incentives for future development of the Sycamore Crossing and Hill Town sites. Future development on the subject sites has the potential to generate water pollutants during both construction and operation. Water pollutants during construction can include sediment, trash, equipment or vehicle fluids, and other equipment or vehicle by-products. Water pollutants generated from operation of future on-site land uses would consists of typical urban stormwater pollutants, such as fertilizer and nutrients, vehicle fluids and other vehicle by-products that collect on streets and parking lots, sediment, and trash.

Both construction- and operation-generated water pollutants would be reduced in accordance with the Contra Costa County SWMP. This plan requires developers and owner/builders to control stormwater quality impacts of their projects by using appropriate BMPs. Minimally, the plan requires the use of BMPs at construction sites. Additionally, to minimize long-term stormwater pollution potential, it requires projects of 5 acres or greater and/or projects in specified sensitive areas to mitigate impacts through site planning or design practices and/or installing stormwater treatment controls. Given the acreage of the project sites, construction and development on both the Sycamore Crossing and Hill Town sites will be required to implement construction-practice BMPs and project design BMPs.

In addition to the requirements of the SWMP, construction on both sites will be subject to the state's General Construction NPDES Permit. Pursuant to this permit, any construction project that involves more than 1 acre of ground disturbance is required to submit a Notice of Intent (NOI) to the RWQCB. This NOI must include a Storm Water Pollution Prevention Program (SWPPP) that identifies the BMPs that will be incorporated during construction. These BMPs will minimize construction-induced water pollutants by

controlling erosion and sediment, establishing waste handling/disposal requirements, and providing non-stormwater management procedures.

Compliance with all SWMP and NPDES requirements would ensure that water pollutants generated on site would remain at less than significant levels. The proposed project, therefore, would not directly or indirectly cause any significant water quality impacts.

Mitigation Measure: None required.

Impact Hyd-2: **The proposed project would alter the drainage pattern of the West Branch of Refugio Creek on the Sycamore Crossing site and detention basins and drainage swale on the Hill Town site and could potentially cause or contribute to flooding.** ***(Potentially Significant; Less Than Significant with Mitigation)***

The project would establish the land use framework and potentially provide redevelopment incentives for future development of the Sycamore Crossing and Hill Town sites. Future development on the involved sites would alter drainage patters and increase stormwater runoff by grading the sites and installing streets, parking lots, rooftops, and other impermeable surfaces. Future development would essentially convert the sites from largely undeveloped land with natural drainage patterns to the built environment with engineered drainage systems.

The West Branch of Refugio Creek traverses the Sycamore Crossing site and the Hill Town site contains a drainage swale and two detention ponds. Future development of the project sites has the potential to modify these drainage features. Modification of these drainage features without replacing their drainage capacity could cause or contribute to local flooding. Additionally, future changes in drainage patterns and increase stormwater flows could adversely affect the existing storm drain system in the surrounding streets. Therefore, the alteration of the drainage pattern on both of the project sites and the risk of flooding which could result is considered potentially significant. **Mitigation Measure HYD-2** would require future development of the Sycamore Crossing and Hill Town sites to include properly engineered drainage systems that comply with the policies of the *City of Hercules General Plan*. The incorporation of this mitigation measure would ensure that the proposed project would not cause flooding and would not significantly impact the storm drain system.

MM HYD-2: Prior to the issuance of a grading or building permit for the Sycamore Crossing or Hill Town sites or for any other site within the Updated 2009 Redevelopment Plan Area, and to the satisfaction of the City Engineer, the project proponents shall prepare hydrology studies and drainage plans that calculate the existing and proposed stormwater runoff flows (i.e., cubic feet per second) of the sites and identify the stormwater drainage features (e.g., storm drains, catch basins, detainment basins, etc.) required to accommodate future flows such that peak post-development flows shall not exceed pre-development flows.

Significance after Mitigation: Implementation of **Mitigation Measure HYD-1** would reduce potentially significant impacts to a less than significant level.

Impact Hyd-3: **The portion of the Sycamore Crossing site within and surrounding the West Branch of Refugio Creek is within the 100-year floodplain, as mapped by the Federal Emergency Management Agency (FEMA). Development on the Sycamore Crossing site has the potential to place housing within the 100-year floodplain and redirect flood flows.** ***(Potentially Significant; Less Than Significant with Mitigation)***

Although the Hill Town site is not within a flood hazard area mapped by FEMA or the City of Hercules, the portion of the Sycamore Crossing site within and surrounding the West Branch of Refugio Creek is within the 100-year floodplain, as mapped by FEMA (see **Figure 3.7-1**). This portion of the Sycamore Crossing site is also within a flood-prone area identified in the *Hercules General Plan*. The City's *General Plan* notes that "high tides and storm-driven waves occurring together could overtop embankments [of Refugio Creek] and flood low-lying coastal areas." Future development on the Sycamore Crossing site has the potential to place housing within flood-prone areas and to redirect flood flows. This impact is considered potentially significant.

Mitigation Measure HYD-3 prohibits the placement of structures within the 100-year floodplain as mapped by FEMA. Implementation of this mitigation measure would ensure that future development would not result in significant impacts related to the 100-year floodplain.

MM HYD-3: The placement of structures within the 100-year floodplain, as mapped by the Federal Emergency Management Agency (FEMA), shall be prohibited. The City of Hercules shall not approve any building plans for structures within the existing FEMA-mapped floodplain unless FEMA approves a Letter of Map Revision (LOMR) that removes the area proposed for structures from the 100-year floodplain.

Significance after Mitigation: Implementation of **Mitigation Measure HYD-1** would reduce potentially significant impacts to a less than significant level.

3.7.6 CUMULATIVE IMPACTS

Much of the land in the project vicinity is already developed. Water pollutants that could be released from development associated with the proposed project include runoff laden with sediment, vehicle and equipment fluids, household chemicals, trash, landscaping by-products, and other typical urban stormwater pollutants. NPDES was established to regulate stormwater pollution. In accordance with NPDES, Contra Costa County and the City of Hercules have implemented an SWMP for urban runoff. All new development including the proposed project would be required to comply with the conditions of the Countywide NPDES permit for municipal storm drains.

Additionally, the SWMP is a regional plan designed to reduce the pollutant levels of receiving waters. Thus, the plan is intended to achieve a cumulative reduction in water pollutants. Compliance with the plan would ensure that future development in the proposed project area would not substantially contribute to cumulative water quality impacts. Therefore, the proposed project in conjunction with other approved and proposed projects would not result in a significant cumulative impact on surface water quality.

As discussed in **Impact Hyd-2**, future development in the proposed merged project area would increase permeable surfaces and, as a result, increase the volume of stormwater runoff that would be directed to the City's storm drain system. The increased stormwater drainage from the proposed project would combine with stormwater flows from surrounding development. While the proposed Added Area would contribute to cumulative stormwater flows, **Mitigation Measure HYD-2** requires future development of the sites to include properly engineered drainage systems. With the incorporation of this mitigation measure, the proposed project's contribution to cumulative stormwater flows would not be considerable.

Finally, implementation of **Mitigation Measure HYD-3** would ensure that impacts associated with the placement of housing in a flood hazard area anywhere within the Updated 2009 Redevelopment Plan Area would be reduced to a less than significant level. Since impacts associated with the location of housing within a flood plain are site specific and individual in nature, the proposed project would not contribute to cumulative flood hazard impacts.