

Hydrology and Water Quality

This chapter evaluates the potential impacts of the proposed Project on hydrology and water quality. Existing hydrology and water quality in the Project area are described as well as the applicable regulatory framework, potential impacts, and measures to mitigate the impacts to a less-than-significant level as applicable.

10.1 Existing Setting

The Project site is in a developed urban area. Onsite vegetation is limited to ornamental trees and shrubs along landscaped medians and sidewalks. Water features nearest to the Project site are limited to Borel Creek (also known as the 19th Avenue Channel), Seal Slough, which leads to Marina Lagoon and the South Francisco Bay (**Figure 10-1**).

Several other creeks are located within and around the City of San Mateo, including San Mateo Creek, which forms the northern boundary of the City with the Town of Hillsborough, and Laurel Creek, which runs along the southern boundary with the City of Belmont. Other notable creeks are scenic Edgewood Creek, which parallels Edgewood Road as it crosses private property; Madera Creek, which runs from the hills in western San Mateo to Borel Creek; and relatively natural Beresford Creek, which flows from the canyons south of Campus Drive to Borel Creek (City of San Mateo, 2010).

10.1.1 Precipitation

The regional climate is temperate and sub-humid and is modified greatly by marine influence. Summer fog is common in this area. Annual temperatures range from an average maximum of 66.8 degrees Fahrenheit (°F) to an average minimum of 47.1°F. The average total mean annual precipitation for the San Mateo area is 20.16 inches, and the mean freeze-free period is about 250 to 300 days (City of San Mateo, 2009).

10.1.2 Watersheds

San Mateo County encompasses four hydrologic basins and 34 watersheds, all of which ultimately drain west to the Pacific Ocean or east to San Francisco Bay. The City of San Mateo includes four major drainage basins (the San Mateo Creek complex, North San Mateo complex, Marina Lagoon complex, and the 3rd and Detroit watershed), each composed of numerous stream channels, culverts, and storm drainage piping systems. The Marina Lagoon complex is further divided into four minor drainage basins; therefore, there are a total of seven major and minor drainages basins (both artificial and natural) within the City (City of San Mateo, 2009).

Laurel Creek, 19th Avenue, 16th Avenue, and Mariner's Island drain to Marina Lagoon and the remaining three drain to the Bay either by gravity or pumping (City of San Mateo, 2009). The Project site is located within the 19th Avenue Drain watershed.

10.1.3 City Drainage System

Most of the open channels carry only seasonal flows. Water quality in the area creeks and channels has not been specifically characterized but is generally thought to be poor because of intercepted urban runoff, which typically carries high concentrations of oil, grease, and metals. In addition, some of the creeks and channels in the service area drain undeveloped areas upstream, often resulting in higher levels of coliform bacteria and suspended solids (EDAW, Inc., 2004).

The City's service area captures and conveys stormwater and flood waters through a system that includes the following:

- 130 miles of storm drains
- 20 miles of open creeks and drainage channels
- 1 flood control lagoon
- 9 pumping stations
- 3 miles of bay front levee

10.1.4 Groundwater

Groundwater in the Project area is part of the San Mateo Plain groundwater subarea, which is in the larger South Bay Groundwater Basin. Groundwater throughout the area is ample, with groundwater flows typically traveling northeasterly, originating in the Coastal Range and flowing toward San Francisco Bay. Local variations in groundwater flow occur in relation to topography, geology, and the geometry of local aquifers. Approximately 16 groundwater wells are operated throughout the City, supplying limited supplies of groundwater for domestic use and irrigation by private, commercial, and government users. Varying groundwater quality and physical entrapment of groundwater within discontinuous and fine-grained sediments, however, limit the use of groundwater as a primary source of water supply in the City.

Groundwater studies were completed for the Bay Meadows Project, which is located south of the proposed Project site. Groundwater has been encountered at depths of approximately 10 to 13.5 feet in the Bay Meadows area. In later studies, groundwater was encountered at depths of 7 to 10 feet. During subsequent geotechnical investigations of the Bay Meadows area, groundwater was encountered at depths from 4 to 19 feet below the existing grade (EDAW, Inc., 2004). A more recent study of the Project site reported groundwater levels ranged between 3.7 and 6.9 feet bgs at the temporary holding structure site (ENGEO, 2018). Groundwater levels beneath the Project site fluctuate seasonally due to tidal action, precipitation, temperature, irrigation, and other factors (ENGEO, 2018).

10.1.5 Flooding

Since 2001, FEMA has issued Flood Zone maps for San Mateo designating certain sections of the City as "high risk." These high-risk areas are required to carry flood insurance if properties have a federally backed mortgage. As development in San Mateo has continued, FEMA has reevaluated the high-risk maps and made adjustments to rate maps. The most recent Flood Zone Map for San Mateo was revised and official as of July 2015 (City of San Mateo, 2015a). According to the most recent Flood Zone Map, the proposed Project is located in Zone X, a zone of minimal flood hazard, which is outside of the 100-year flood hazard area and higher than the elevation of the 0.2-percent-annual-chance flood (City of San Mateo, 2015a; FEMA, 2017).

Though San Mateo is near San Francisco Bay, it is not subject to risk of flooding from tsunami or tidal action because the potential for tsunami or extreme tidal fluctuations is low in the Bay. In addition, the City's levees are structurally stable and have a low probability of failure, though dike failure would only flood a minor portion of the proposed Project area along its eastern edge and flooding would only affect areas below an elevation of 104.7 feet (see Figure 4.8-2 in the General Plan EIR). The proposed Project site is, however, within the area of potential inundation in the event of a failure of Crystal Springs Dam and Laurel Creek Dam. Crystal Springs Dam, which retains the water supply for San Francisco and most cities within San Mateo County, and Laurel Creek Dam, which provides important flood control for the City of San Mateo, both have an extremely low risk of failure.

10.2 Regulatory Framework

The proposed Project is subject to all federal, state, and local regulations pertaining to water quality, pollutant emissions, and drainage. Regulations pertaining to hydrology and water quality in the proposed Project area are discussed in the following sections.

10.2.1 Federal Regulations

The federal CWA, as amended, is the fundamental federal law for regulating discharges of waste into waters of the United States. Section 402 of the CWA provides NPDES requirements, which have been established for stormwater discharges from a range of industrial discharge categories, including construction activities. The EPA has delegated administrative authority for implementing the NPDES program to the State of California. The SWRCB and nine RWQCBs have authority to implement the CWA in California. In San Mateo, the San Francisco Bay RWQCB oversees implementation of the NPDES program. Construction projects with disturbance areas greater than 1 acre would require coverage under the State's Construction General Permit (CGP) (CAS0000001, Order 2009-0009-DWQ as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ). The permit requires development and implementation of a site-specific SWPPP, which must include BMPs to provide an effective combination of erosion and sediment controls.

The proposed Project is subject to federal regulations governing discharge from point sources and "wet weather point sources," such as urban storm sewer systems and construction sites, as defined in Sections 1311-1330 of the CWA (33 USC 26, Subchapter III).

10.2.2 State Regulations

The Porter-Cologne Water Quality Control Act provides for protection of the quality of all waters of the State of California. The act gives the California SWRCB and RWQCBs regulatory authority to establish water quality standards and implementation plans to achieve those standards.

The SWRCB and RWQCBs are responsible for preserving, enhancing, and restoring the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations (SWRCB, 2015). The SWRCB makes statewide regulations governing water use and point source and non-point source pollutant discharges; the RWQCBs work in regions of the state to implement SWRCB policies and regulations, while also establishing additional region- and area-specific regulations and policies to achieve water quality goals. Operation of the City's sanitary sewer collection system and WWTP is regulated by the San Francisco Bay RWQCB. The City's collection system has a history of wet weather SSOs that result in the discharge of untreated or partially treated wastewater. In March 2009, the RWQCB issued a Cease and Desist Order jointly to the City of San Mateo, the Town of Hillsborough, and the CSCSD mandating elimination of SSOs in the collection system and requiring specific corrective actions.

10.2.3 Local Regulations

10.2.3.1 San Mateo Countywide Water Pollution Prevention Program

Water pollution degrades surface waters, making them unsafe for drinking, fishing, swimming, and other activities. The San Mateo Countywide Water Pollution Prevention Program was established in 1990 to reduce the pollution carried by stormwater into local creeks, San Francisco Bay, and the Pacific Ocean. The program is a partnership of the City/County Association of Governments of San Mateo County, each incorporated city and town in the county, and San Mateo County, which share a common NPDES permit. The federal CWA and the Porter-Cologne Water Quality Control Act require that large urban areas discharging stormwater into San Francisco Bay or the Pacific Ocean have an NPDES permit to prevent

harmful pollutants from being dumped or washed away by stormwater runoff into the stormwater system and then discharged into local water bodies.

The Stormwater Management Plan outlines the priorities, key elements, strategies, and evaluation methods for the San Mateo Countywide Water Pollution Prevention Program. The comprehensive program includes pollution reduction activities for construction sites, industrial sites, illegal discharges and illicit connections, new development, and municipal operations. The program also includes a public education effort, target pollutant reduction strategy, and monitoring program.

10.2.3.2 San Mateo City Charter and Municipal Code

Ordinances addressing stormwater management and controlling non-stormwater discharge in the City of San Mateo are contained in Title 7, Chapter 39, Stormwater Management and Discharge Control, of the City's Municipal Code (City of San Mateo, 2015b). Included in the Code is the City's requirement for a Stormwater Pollution Prevention Program construction (SWPPC) permit. The permit regulates the discharge into the City's stormwater system and is in coordination with the San Mateo Countywide Water Pollution Prevention program discussed in Section 10.2.3.1.

10.3 Assessment Methods and Thresholds of Significance

This impact analysis focuses on potential effects on drainage, flooding, and water quality associated with implementation of the proposed Project. The analysis was made by using available information regarding the water quality and hydrologic characteristics of the Project area, subsurface testing, proposed Project plans, and applicable regulations and guidelines. Impacts on hydrology and water quality may occur if the proposed Project would result in the following:

- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin
- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surface, in a manner which would: substantially increase the rate or amount of surface runoff, result in flooding or substantial erosion or siltation onsite or offsite, or 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; or impede or redirect flood flows
- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan

The City of San Mateo is not subject to risk of inundation by seiche or tsunami. Proposed facilities would be below ground and not subject to mudflows. Impacts associated with inundation by seiche, tsunami, or mudflow are not discussed further. Additionally, the Project does not include long-term groundwater pumping as part of Project implementation and, therefore, would not obstruct implementation of a sustainable groundwater management plan, and, thus, is not discussed further.

10.4 Environmental Impacts

Impact 10-1. Would the proposed Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?

Excavation during construction of the temporary holding structure, pump station, odor control equipment room, and associated diversion sewer lines could result in excavation in the water table, which would require dewatering. Dewatering during excavation may result in impacts on groundwater supplies. However, dewatering would be required only during the initial phases of excavation and construction and would not occur for substantial periods of time. Because of the short duration of dewatering, the volume of groundwater removed would be expected to be minor. As described in Section 10.1.4, groundwater throughout the area is ample but is not widely used as a water source due to quality and accessibility. Impacts of construction of the proposed Project on groundwater supplies would be less than significant.

Operation of the proposed Project would not use groundwater resources. The proposed Project would result in negligible to no increase in impervious surfaces because the ground surface would be returned generally to pre-Project conditions. Impacts to groundwater supplies from operation of the proposed Project would be less than significant.

Impact 10-2. Would the proposed Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality, or conflict with or obstruct implementation of a water quality control plan?

Construction of the proposed Project would entail excavation, grading, and other earth-disturbing activities that would expose and disturb soils, resulting in the potential for increased erosion by wind or rainfall. Stormwater could convey eroded sediment into storm drains connecting to Borel Creek that could result in siltation and increase nutrient loading and total suspended solids concentrations in Borel Creek and downstream receiving waters. Materials used during construction, including drilling muds and paving materials, as well as activities such as equipment refueling and maintenance, have the potential to discharge construction pollutants such as gasoline, oil, rubber particles, herbicides, paint, adhesives, and tar into storm drains that drain to nearby Borel Creek and degrade water quality. Discharges into storm drains during excavation may contain chemical constituents and sediment that could degrade water quality in Borel Creek and downstream receiving waters such as Marina Lagoon if discharged improperly.

Implementation of Final PEIR **Mitigation Measure 10-2, Install and apply erosion control and stormwater best management practices during construction**, and Project-specific **Mitigation Measure 10-2a, Obtain discharge permits to comply with discharge requirements**, would ensure that construction activities would not significantly degrade water quality in Borel Creek and downstream receiving waters, and impacts would be less than significant.

Operation of the proposed Project would substantially improve water quality by controlling wet weather flow rates to the WWTP, resulting in improved water quality discharge from the plant into the Lower San Francisco Bay. The proposed Project would also provide additional storage and conveyance capacity in the collection system, which will help the City to meet current regulatory requirements regarding SSOs, reducing the discharge of raw sewage in the surrounding area, including Lower San Francisco Bay, thereby resulting in improved water quality.

Impact 10-3. Would the proposed 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 through the addition of impervious surface, in a manner which would: substantially increase the rate or amount of surface runoff, result in flooding or substantial erosion or siltation onsite or offsite, or 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; or impede or redirect flood flows?

Construction of the proposed Project could result in temporary changes in localized drainage patterns that could change surface runoff and affect stormwater facilities or offsite water quality. Implementation of Final PEIR **Mitigation Measure 10-2, Install and apply erosion control and**

stormwater best management practices during construction, would prevent surface runoff from discharging into storm drains, thereby reducing any effects of increased runoff volumes to a less than significant level.

Once construction is completed, the Project area would be restored to pre-Project conditions, and would not result in changes to drainage patterns. In addition, the majority of the new facilities would be below ground and would not affect drainage patterns, and the Project site will be paved with pervious concrete so stormwater runoff will not be increased.

Neither construction nor operation of the proposed Project would alter the course of a stream or river.

With implementation of Final PEIR **Mitigation Measure 10-2, *Install and apply erosion control and stormwater best management practices during construction***, effects of the proposed Project on drainage patterns and surface runoff would be minor, and impacts on flooding, erosion, and stormwater drainage system capacity would be less than significant.

10.5 Mitigation Measures

10.5.1 Final PEIR Mitigation Measure

Implementation of the following mitigation measure from the Final PEIR would ensure that potential impacts on hydrology and water quality would remain at a less-than-significant level.

Mitigation Measure 10-2. Install and apply erosion control and stormwater best management practices during construction.

Applicable erosion control and stormwater BMPs shall be installed and maintained during construction for all earth-disturbing activities. Construction activities shall be required to comply with all RWQCB regulations and procedures for discharging wastewater, including dewatering discharges, as detailed in the SWPPP prepared for each project and as required under Chapter 7.39 of the Municipal Code (City of San Mateo, 2015b). Applicable BMPs to reduce erosion and siltation and protect water quality can include, but are not limited to: designate construction access routes; stabilize construction access points; stabilize cleared and excavated areas by providing vegetative buffer strips, plastic coverings, and applying ground base on areas to be paved; protect adjacent properties and waterways by installing sediment barriers, filters, or vegetative buffer strips; prevent surface runoff from discharging into storm drains; use sediment controls and filtration to remove sediment from water generated by dewatering; and avoid refueling and vehicle maintenance on construction sites as feasible.

10.5.2 Project-Specific Mitigation Measures

Implementation of the following Project-specific mitigation measure would ensure that potential impacts on hydrology and water quality would be less than significant.

Mitigation Measure 10-2a. Obtain discharge permits to comply with discharge requirements.

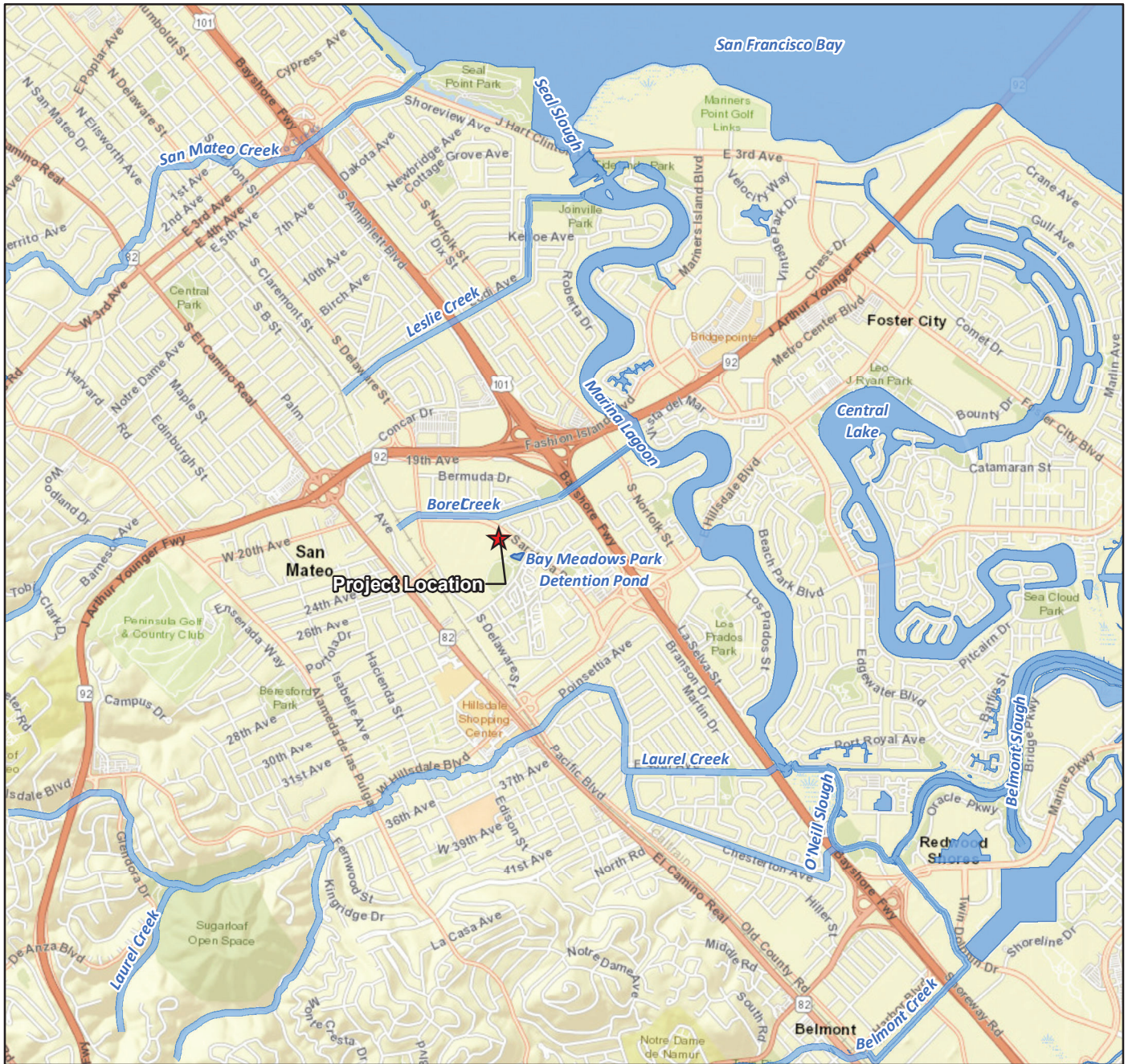
The City or its contractors shall obtain and comply with discharge permits as appropriate for discharge of dewatering water.

10.6 References

City of San Mateo. 2009. *Draft Environmental Impact Report for the City of San Mateo General Plan Update*. July 27.

_____. 2010. *City of San Mateo General Plan – Vision 2030*. Resolution No. 134-2010. Adopted by the City Council on October 18.

- _____. 2015a. City of San Mateo FEMA Flood Zones website.
<http://www.cityofsanmateo.org/index.aspx?nid=1797>. Accessed January 23, 2018.
- _____. 2015b. *San Mateo City Charter and Municipal Code*. Available at
<http://qcode.us/codes/sanmateo/>. Effective as of September 17.
- EDAW, Inc. 2004. *San Mateo Corridor Plan and Bay Meadows Specific Plan Amendment EIR*.
- ENGEO. 2018. *Basin 2 and 3 Collection System Improvements Underground Flow Equalization System Facility and Diversion Sewers San Mateo, California - Geotechnical Sampling Data Report*. August 28.
- Federal Emergency Management Agency (FEMA). 2017. FEMA's National Flood Hazard Layer (Official).
<https://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cbe088e7c8704464aa0fc34eb99e7f30>. Accessed December 29.
- State Water Resources Control Board (SWRCB). 2015. "About the Water Board" website.
http://www.swrcb.ca.gov/about_us/.



VICINITY MAP

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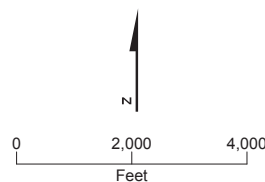


FIGURE 10-1
Water Features
 Underground Flow Equalization System, Environmental Impact Report
 City of San Mateo Clean Water Program