

7 UTILITIES AND SERVICES

7.1 PURPOSE

This chapter describes storm drainage, sewer, water, energy, solid waste and other utility infrastructure improvements to serve the development of the Baylands. An overall goal for the Baylands utilities and services networks is to use eco-friendly techniques and technologies wherever possible, including, most notably, a natural approach to stormwater management. The vision underlying the sustainable planning approach is described in *Chapter 3: Sustainability Framework*. The full infrastructure plan is contained in *Appendix D* of the Specific Plan.

The following goal and policy shall apply to all utilities and services:

Goal 7.1: Efficient and environmentally compatible utilities and services that adequately serve new development.

Policy 7-1: All utilities and services shall be installed or provided according to applicable jurisdictional standards.

Additionally, sustainability is woven throughout the development strategy for the Baylands. As such, the utilities and infrastructure element contains key elements that advance these sustainable practices. Key aspects of this plan include:

- A multi-leveled approach to stormwater management including:
 - An improved natural drainage channel along Visitacion Creek that is supported by a new system of wetlands and bioretention areas. (See Section 7.2.4.3)
 - Stormwater detention zones integrated within the creek channel. (See Section 7.2.5)
 - Bioretention elements included in the majority of the street network and in certain open space areas to detain and filter stormwater runoff. These include structured bioretention areas in the densest urban environments, bioretention swales in a range of sizes, and raingardens. (See Section 7.2.5)

- A water recycling facility that will treat sewerage through a series of filters and constructed wetlands, and will produce a supply of recycled water. (See Sections 7.4.3 and 7.5.2.2)
- A solar farm of ground-mounted solar panels totaling up to 25 acres that will produce energy on-site to augment the energy needs of future development. (See Section 7.8.1.2)
- A robust recycling program that reduces waste generation, includes composting, provides recycling containers for each building and in open space areas, and utilizes public awareness and education program. (See Section 7.7)
- Efficient, sustainable building design that will place less strain on electricity and water needs through the use of efficient fixtures, appliances, building and landscape materials and site design. (See Section 7.3.3)

These features of the Baylands plan are described in greater detail in the sections that follow, and are identified in *Chapter 3: Sustainability Framework* and throughout the Specific Plan.



The improvement of the drainage channel at Visitation Creek is a primary element of the sustainable infrastructure at the Baylands.



Green roofs and solar infrastructure will lessen the impact of future development on existing and proposed infrastructure and utilities.

7.2 STORM DRAINAGE

7.2.1 Drainage System Goals

The storm drainage concept for the Baylands project emphasizes natural stormwater management using an improved Visitation Creek, otherwise known as the Central Drainage Channel, expanded wetlands, and bioswales. The Visitation Creek and its realigned corridor will comprise the centerpiece of the Bayland's major open space component, Visitation Creek Park, as described in *Chapter 5*.

Goal 7.2: An open storm drainage system and expanded wetlands that reduce flooding and improve water quality.

Goal 7.3: Integration of natural drainage with open space to provide habitat and recreational resources.

7.2.2 Existing Storm Drainage System

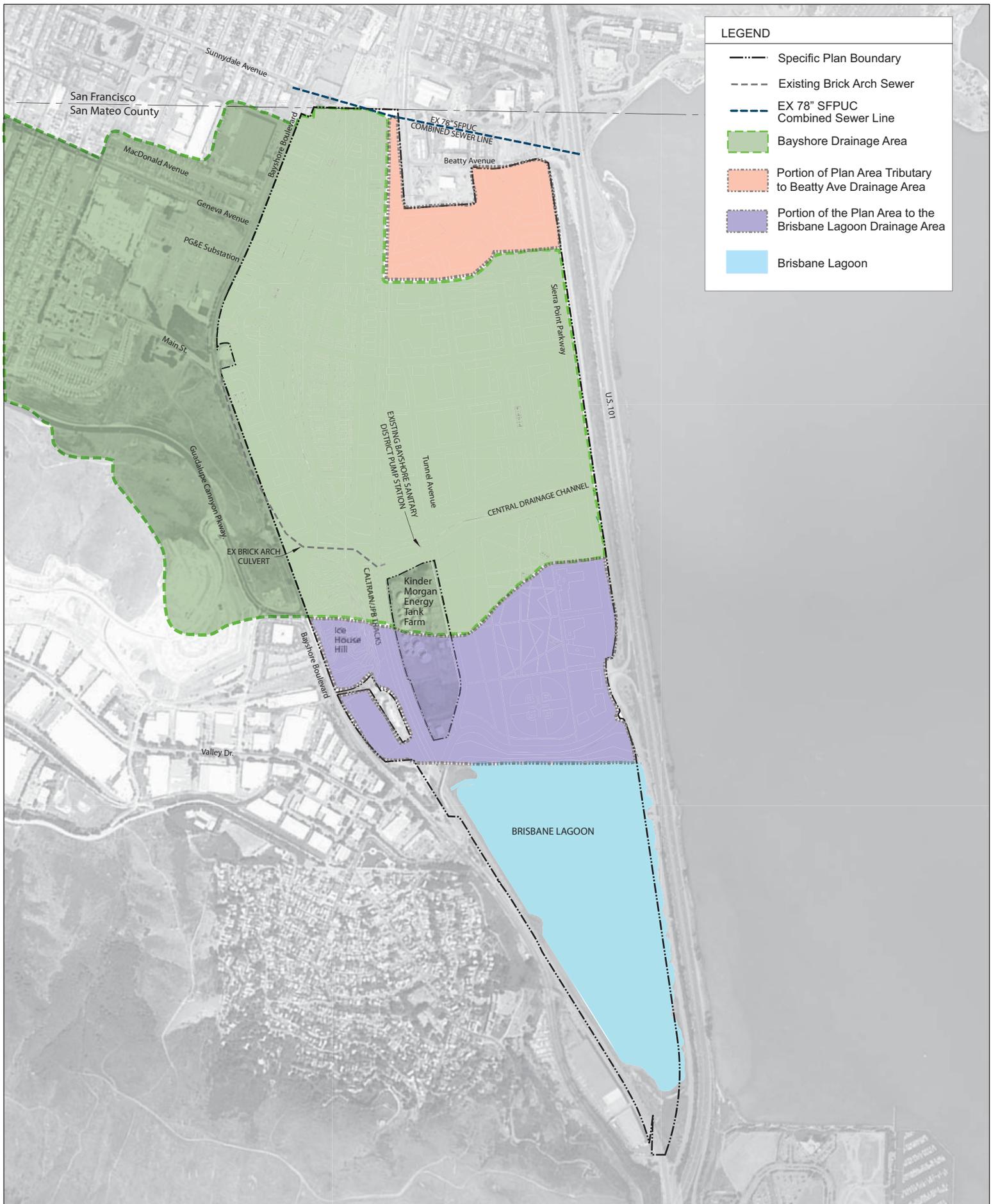
The approximately 684-acre Planning Area is located within three existing drainage areas—Bayshore, Brisbane Lagoon, and Beatty Avenue. See Figure 7.0 Existing Drainage Areas.

7.2.2.1 Bayshore Drainage Area

The Bayshore drainage area is relatively steep and well-defined and is bound on the west and south by the slopes of the San Bruno Mountains. The Bayshore drainage area is divided into two sections: the Upper Reach and the Lower Reach. Encircling the upstream portion of the Bayshore drainage area west of Bayshore Boulevard, the Upper Reach manages storm water runoff from portions of Daly City, Brisbane, and the San Francisco watershed. Located entirely within the City of Brisbane, the Lower Reach drainage area conveys the storm water runoff from the area east of Bayshore Boulevard and flow from the Upper Reach drainage area for discharge to the San Francisco Bay through a culvert under U.S. 101.

Upper Reach Drainage Facilities

- ***Daly City Storm Drain Network*** - The Daly City pipe network encompasses the western, upstream portion of the Upper Reach, where the highest elevations are located. Much of the runoff from the steeper areas travels along surface routes through natural channels and street gutters before entering the pipe network. The Daly City storm drain network terminates in a 60-inch diameter inverted siphon that discharges to the upper open channel on PG&E's Martin Substation on Geneva Avenue.
- ***Upper Open Channel*** - The Daly City storm drain system discharges from the 60-inch inverted siphon at the eastern end of Midway Village into a 1,300-foot-long open channel. The channel winds its way across the southern portion of the Martin Substation and the Levinson Property in Brisbane to Bayshore Boulevard. There it discharges to a 90-foot-long, 8-foot-by-5-foot box culvert connected to 54-inch storm drain culvert under Bayshore Boulevard. The existing headwall and inoperable weir at the discharge point of the open channel have recently been replaced to improve system efficiency by allowing unrestricted flow to the box culvert and subsequent 54-inch storm drain line under Bayshore Boulevard.



- ***Levinson Overflow Area*** - This 3.8-acre parcel is located across Bayshore Boulevard from the Baylands at the northwest corner of Main Street and Bayshore Boulevard. The entire parcel is currently undeveloped and occasionally ponds due to direct precipitation, overflow runoff from the adjacent Martin Substation, and overtopping of the contiguous upper open channel. Fed by a sideways weir in the upper open channel, an approximately 6.5-foot deep, 2.5-acre detention basin has been recently constructed on-site to alleviate downstream and Bayshore Boulevard flooding. During a 100-year design storm event, the water level of the detention basin exceeds the height of the berm and overflows onto Bayshore Boulevard.
- ***Bayshore Boulevard Drainage Facilities*** - Bayshore Boulevard has an approximate low point of elevation 8 located 450 feet to the north of the Bayshore box culvert. Bayshore Boulevard is currently drained by a 4-foot-by-3-foot box culvert located on the west side of the street and two 24-inch-diameter parallel storm drain lines on the east side of the street. Both the eastern and western portions of the Bayshore storm drain system infrastructure discharge into the 54-inch storm drain pipe under Bayshore Boulevard.
- ***Brick Arch Sewer*** - Storm water from the both the 8-foot-by-5-foot box culvert and Bayshore Boulevard drainage facilities discharge through the 54-inch storm drain line under Bayshore Boulevard, into a 3,500-foot-long, 7.5-foot-high-by-8-foot-wide brick arch sewer. The brick arch sewer conveys flow from the outlet of the Bayshore Boulevard 54-foot storm drain line, along Bayshore Boulevard, to the eastern side of the Caltrain mainline tracks.

Lower Reach Drainage Facilities

- ***Railyard Drainage Channel*** - The existing railroad yard drainage channel consists of an earthen channel that parallels Industrial Way for a length of about 2,400 feet and drains the former railyard. The average channel bottom width is about 6 feet, and the average top width is about 18 feet. The railroad yard channel discharges to the brick arch sewer about 500 feet upstream of the Caltrain mainline tracks.
- ***Timber Box Culvert*** - The brick arch sewer discharges to a 440-foot long, 5.3-foot wide-by-10-foot-high timber box culvert located in the former landfill area. The timber box culvert conveys flow from the Caltrain mainline tracks to the lower open channel (see below) approximately 150 feet west of Tunnel Avenue. Due to its limited capacity and disrepair, the Timber Box culvert is recommended for removal.

- **Lower Drainage Channel** - The lower drainage channel is a 2,400-foot-long section of open earthen channel located in the landfill. The average channel bottom width is about 17 feet with an average top width of approximately 60 feet, and the channel is segmented by three road crossings. The western crossing at Tunnel Avenue and the central crossing consist of double 78-inch diameter culverts. The eastern crossing near the Frontage road consists of a single 96-inch diameter culvert.
- **U.S. 101 Box Culvert** - The lower drainage channel discharges to San Francisco Bay through a 300-foot long, 12-foot-by-12-foot box culvert located under U.S. 101.

7.2.2.2 Beatty Avenue Drainage Area

At the northeastern portion of the Baylands, approximately 55 acres of the former landfill drain into the Beatty Avenue storm drain system. Stormwater runoff is captured by a series of inlets in the local streets and conveyed in a northerly direction through a succession of 30-inch and 42-inch reinforced concrete pipes. The system traverses under U.S. 101 and discharges to the Harney Way Box Culvert and into the Sunnydale pump station, located east of U.S. 101 on Harney Way in Brisbane.

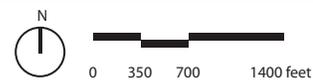
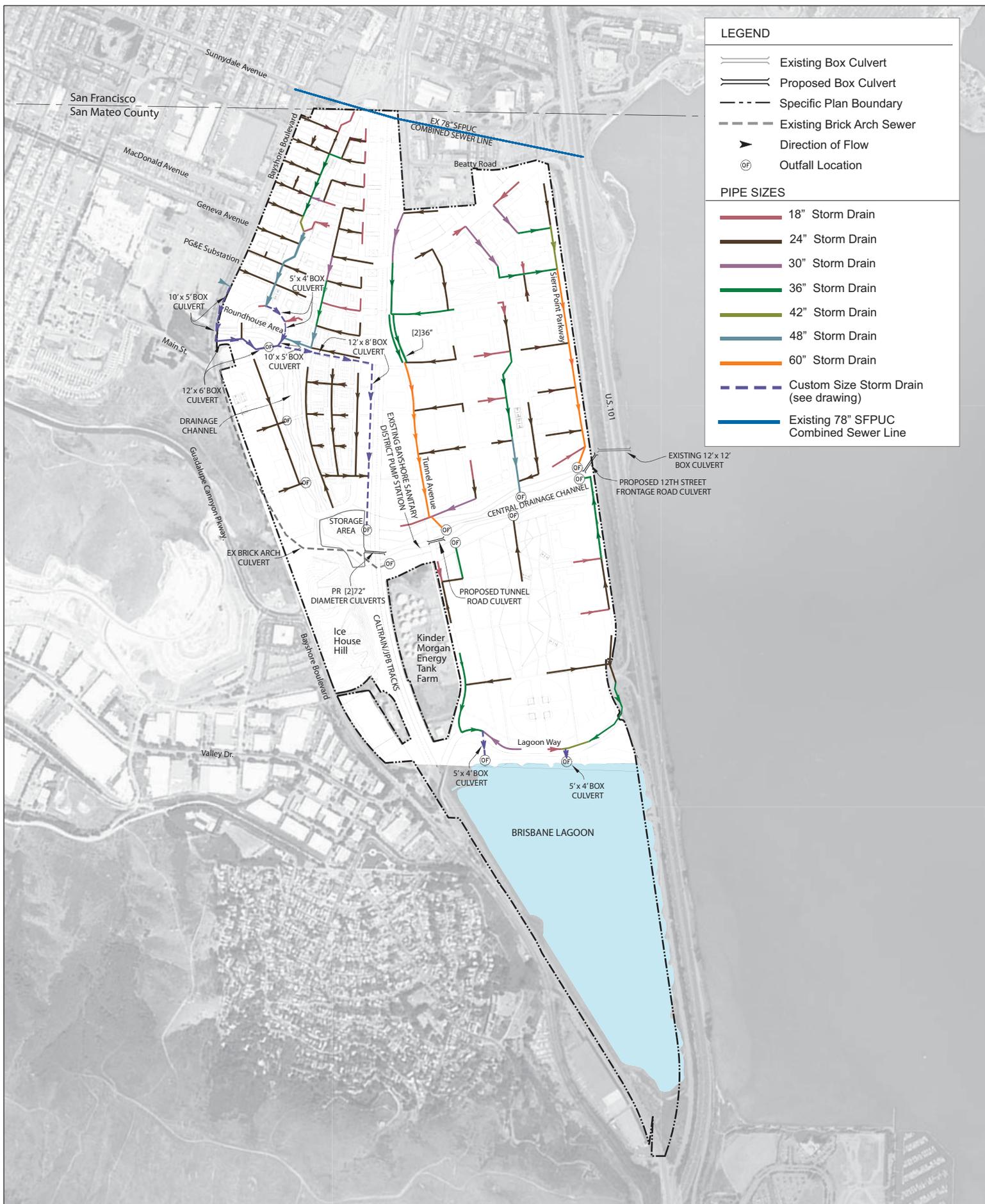
7.2.2.3 Brisbane Lagoon Drainage Area

Adjacent to the Brisbane Lagoon, 52 acres of the landfill drain to the Brisbane Lagoon. Flow from the ground surface is conveyed through a series of shallow swales adjacent to Lagoon Way, and discharges through small culverts running under Lagoon Way. Upon exiting the Lagoon Way culverts, the flow continues overland in a southerly direction to the Brisbane Lagoon.

7.2.3 Proposed Storm Drainage System

The proposed Baylands storm drainage collection system will be designed in compliance with the City of Brisbane requirements, the City of Brisbane Storm Drainage Master Plan (BSDMP) by RBF Consulting, dated November 2003 and supplemental project-specific storm drainage reports.

A combination of proposed site planning, proposed roadway alignments, and capacity deficiencies in the City of San Francisco 78-inch combined sewer line have resulted in the shiftment of approximately 47 acres of catchment area from the Beatty Avenue drainage area to the Bayshore drainage area. This change results in reducing the catchment area of the Beatty Avenue watershed to approximately 8 acres. Existing storm drain infrastructure within the 47 acres being transferred to the Bayshore drainage area will be removed. Since



little to no redevelopment will occur in this area, the infrastructure within the remaining 8 acres within the Beatty Avenue drainage area will be preserved in its current location and will continue to operate as it does in its current condition.

Adjacent to the Brisbane Lagoon, approximately 52 acres of the development at the southern portion of the former landfill contribute stormwater flow to the Brisbane Lagoon watershed. The existing culverts under Lagoon Way will be removed as part of the Title 27 landfill closure process. Storm water runoff will be captured in a series of pipes, which outfall to the Brisbane Lagoon at two locations.

See Figure 7.1 for the proposed storm drainage system improvements.

7.2.4 Proposed System Wide Storm Drain Improvement Projects

In response to the BSDMP, improvements to the existing City and private storm drainage facilities are recommended at certain onsite and offsite locations in order to increase capacity and convey runoff from both the proposed development and existing City streets.

7.2.4.1 Bayshore Boulevard Improvements

To alleviate existing episodes of flooding during large storm events near the Bayshore Boulevard and Industrial Way intersection, Bayshore Boulevard drainage inlets fronting the Levinson Overflow area will be hydraulically isolated from the existing Bayshore system and brick arch sewer. This will act to both improve flooding conditions and increase the conveyance capacity of the Bayshore Boulevard storm drainage system. Flow will instead converge at a proposed large inlet structure near the Bayshore Boulevard-Industrial Way intersection and be routed to the proposed Visitacion Creek within the Baylands development through a 12-foot-by-6-foot box culvert.

7.2.4.2 Brick Arch Sewer Improvements

Flow from the Upper Reach portions of the Bayshore drainage area will continue to flow through the brick arch sewer. To provide unobstructed flow in the channel area, a new headwall and outfall structure will be installed at the interface between the proposed Visitacion Creek, described below, and the brick arch sewer.

7.2.4.3 Proposed Visitacion Creek Improvements

Visitacion Creek will continue to be the main component of the Bayshore drainage area. The existing drainage channel, between the railroad tracks and U.S. 101, will be improved

and extended to the Roundhouse area. In addition to discharges from the brick arch sewer and the hydraulically isolated area of Bayshore Boulevard, runoff from the Baylands development on both the former landfill and railyard areas will be collected in the on-site collection system for discharge to the channel in one of 10 outfalls to the Visitacion Creek. The portion of the Visitacion Creek between the Roundhouse and the end of 2nd/3rd Streets will be elevated due to environmental constraints and a high groundwater table. The elevated section of the Visitacion Creek will then transition down to the Visitacion Creek bioretention zone west of the railroad culvert and north of Icehouse Hill.

The Visitacion Creek will be improved with an open channel design, consisting of a 10 to 20-foot-wide flat bottom with 3:1 side slopes (see Figure 5.7) to accommodate the overlapping of a 100-year design storm event with tidal flow, and with consideration of estimated sea level rise over the next century.¹ A 2- to 3-foot-high weir will be installed just upstream of the U.S. 101 culvert to ensure that 1.5 to 2 feet of water is contained within a new saltwater wetlands area. The channel bottom and side slopes will be planted with a combination of wetland plants, native grasses, and wildflowers, which are able to thrive in saline conditions and provide slope stability. An impermeable liner will be installed within the channel bottom and side slopes to protect channel flow from permeating into the landfill.

Visitacion Creek Culverts

To help facilitate free flow movements for railroad, vehicular, and pedestrian traffic, 4 culverts will be provided within the Visitacion Creek, as shown in Exhibit 7.1: the railroad track culvert, Tunnel Avenue culvert, Frontage Road culvert, and the existing 12-foot-by-12-foot box culvert under U.S. 101 that discharges to the San Francisco Bay.

¹ To represent the current sea level conditions, the project uses the Army Corps of Engineers 100-year storm event tide elevation of 6.9 (NGVD 29) as baseline for design. Adding the baseline to the anticipated sea level rise estimates of 16 inches by mid century and 55 inches by the end of the century, the anticipated 100-year tide levels are approximately 8.25 (NGVD 29) by mid-century and 11.5 (NGVD 29) by the end of the century. The maximum HGL in the Visitacion Creek at the Roundhouse rises to an elevation of approximately 9.9 by mid-century and 11.9 by the end of the century.

Channel grading on the former landfill has been designed to accommodate the anticipated mid-century hydraulic grade line (HGL) elevations within the Visitacion Creek, with a minimum of 4 feet of freeboard at construction and approximately a minimum of 2 feet of freeboard based on anticipated settlement. To accommodate the end of century HGL and the effects of sea level rise and anticipated settlement, portions of the banks containing the Visitacion Creek may have to be raised to provide freeboard, thus the top of banks on either side of the Visitacion Creek will be designed as adaptable. Incorporating adaptable bank design measures as part of the Visitacion Creek will enable the top of bank elevations to be easily raised over time based on the freeboard requirements and Visitacion Creek water level conditions.

Channel grading on the former railyard has been designed to accommodate the anticipated mid century HGL elevations within the Visitacion Creek, with a minimum of 4 feet of freeboard at construction and a minimum of approximately 2 feet of freeboard based on anticipated settlement. At the end of century, it is anticipated that approximately 0.5 feet of freeboard will be available within the Visitacion Creek based on the anticipated Visitacion Creek HGL elevation and the effects of settlement and sea level rise. Techniques, such as surcharging with wick drains, may be employed in the area to reduce the settlement; furthermore, this would also allow for a larger amount of freeboard at the end of century. Alternatively, if required, the banks enclosing the Visitacion Creek within the railyard can be designed as adaptive, which allows the top of bank elevations to be raised up, providing additional freeboard.

Stormwater Runoff Storage within Visitacion Creek

The stretch of the improved Visitacion Creek between the Roundhouse area and the railroad culvert will be sized to accommodate runoff that originated offsite from across Bayshore Boulevard, as well as runoff from the majority of the former railyard area of the Baylands in order to alleviate existing flooding conditions.

7.2.5 Stormwater Treatment

Stormwater treatment at the Baylands will be designed to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) municipal stormwater permits, as implemented by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). SFBRWQCB's Provision C.3, as well as the San Mateo Countywide Water Pollution Prevention Program C.3 Stormwater Technical Guidebook (Guidebook), recommends that projects investigate opportunities to incorporate low-impact development (LID) strategies, such as infiltration, stormwater reuse and evapotranspiration, as primary design strategies. Given the presence of clay soils and environmentally compromised soils in the former railyard, and municipal sanitary waste and clay soils in the former landfill, opportunities to infiltrate will be severely limited, if not infeasible. In addition, the proposed Water Recycling Facility will provide recycled water for irrigation demands and potentially for dual plumbing demands within the proposed buildings; thus, the need for stormwater reuse will be limited.

For the Baylands, LID strategies will instead emphasize the use of natural, landscape-based stormwater treatment measures as the preferred means of providing stormwater management. The stormwater run-off from the Baylands will be treated by a combination volume- and flow-based treatment concepts, which may include one or more of the following options:

- Bioretention Swale (Flow-and-volume-based)
- Vegetated Buffer Strips (Flow-based)
- Tree Well Filters (Flow-based)
- Flow-through Planter Boxes (Flow-based)
- Bioretention Areas (Flow-and-volume-based)
- Extended Detention Basins (Volume-based)
- Pervious Pavements (Volume-based)
- Green Roofs (Flow and Volume-based)

Project stormwater treatment designs will ensure that stormwater runoff is treated prior to discharge to the Visitacion Creek, Brisbane Lagoon and the San Francisco Bay in compliance with Provision C.3. Infiltration-type treatment measures will be underlain with a perforated storm drain pipe on top of an impermeable liner to prevent both water infiltration into contaminated soils and groundwater, and leachate creation. To support the physical stormwater management designs, source control measures, such as community outreach, stormwater management literature and stormwater inlet stenciling, will be used at the Baylands.



Vegetated Bioretention Area (Structured)



Detention Basin



Vegetated Bioretention Area (Bioswale)



Wetland



Raingarden



Porous Paving

The selection of stormwater treatment measures will be reviewed in detail with the City of Brisbane during the permitting process to inform the development of the final Stormwater Management Plan (SMP). The SMP will act as a guidance mechanism for both construction and post-construction installation and maintenance requirements to promote efficient performance of the Baylands stormwater treatment methods.

7.3 WATER SYSTEM

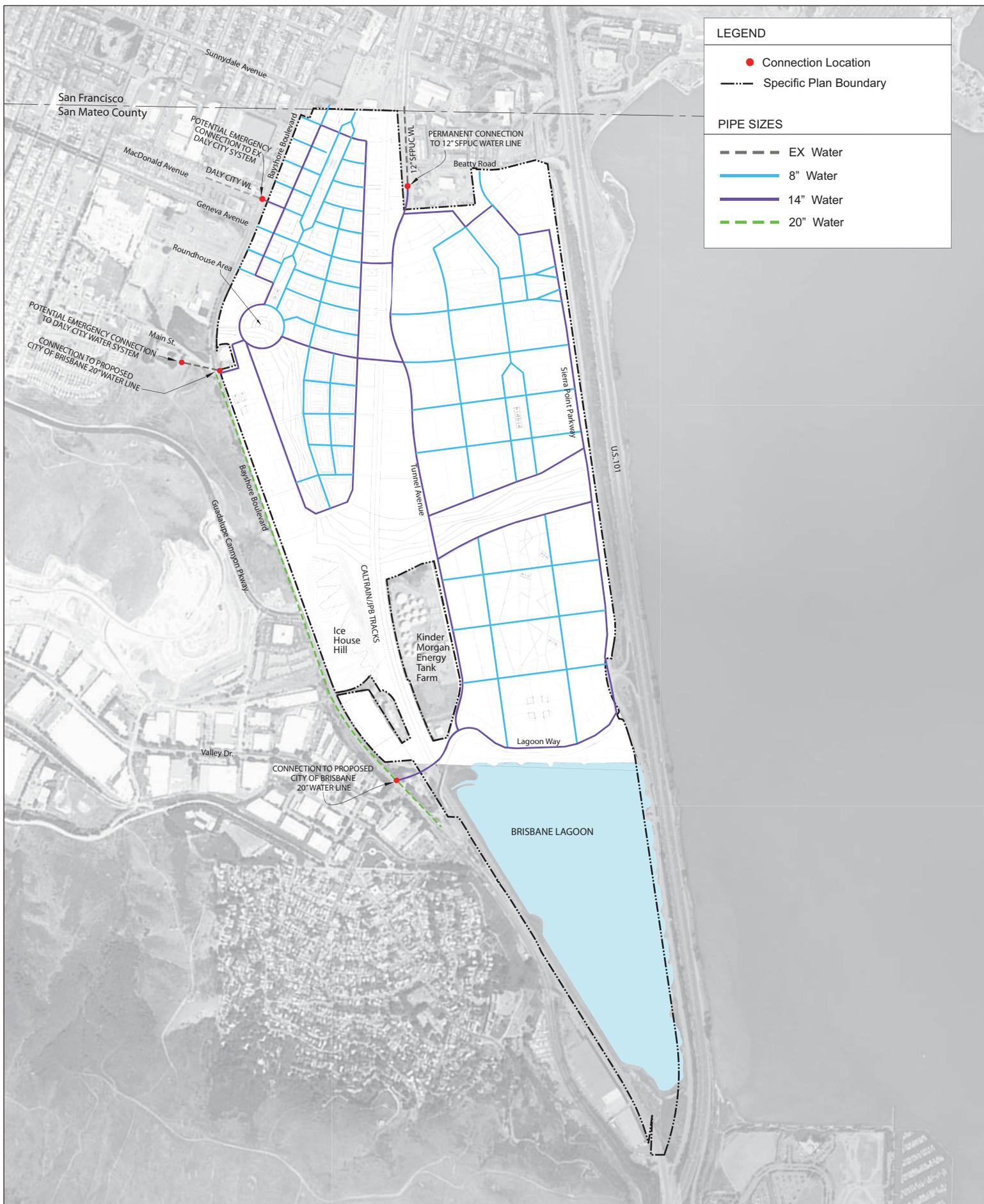
7.3.1 Existing Water Provider

The Baylands is located within the water service area of the City of Brisbane. The City currently purchases all its water from the San Francisco Public Utilities Commission (SFPUC) through connections to SFPUC transmission pipelines that traverse the City. No groundwater resources or surface water supply are currently available to the City. While existing land uses on the Baylands are served by the City, it does not currently have a water supply allocation for additional developments on the Baylands. Future development of the Baylands will require additional sources of domestic water, supplemented by recycled water for non-potable uses and demand reduction through water conservation measures.

7.3.2 Existing Water Distribution System

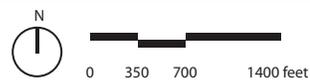
The City's water system includes about 25 miles of water main, ranging in diameter from 4 to 16 inches, in six pressure zones serviced by four booster pumping stations and four storage tanks. Working in tandem, the City of Brisbane and Guadalupe Valley Municipal Improvement District (GVMID) operate the water distribution system with five turnouts from the SFPUC aqueduct supplying water to their service areas within Brisbane. Existing water service to the Baylands is delivered from multiple locations. Within Bayshore Boulevard, the City of Brisbane owns a 12-inch diameter water line located about 1,800 feet south of the northwestern corner of the intersection of Bayshore Boulevard and Main Street. In addition, there is an existing 14-inch water line that runs along Main Street to the intersection at Bayshore Boulevard and continues south along Industrial Way and terminates at a point on Tunnel Avenue just north of the northeast corner of the Tank Farm.

An additional 12-inch water main owned by the SFPUC within Tunnel Avenue serves the existing Sierra Point and Van Arsdale Lumber properties and connects with the adjacent SFPUC system in San Francisco. West of the Baylands the Daly City system operates a 6-inch water line in MacDonald Avenue that terminates near Bayshore Boulevard.



Brisbane Baylands Specific Plan

7.2 Conceptual Water System



7.3.3 Future Water Demands and Criteria

The California Code of Regulations, Title 22, requires that the water distribution system be capable of delivering domestic demand coincident with the required fire flow. The new domestic water system at the Baylands will need to deliver the maximum daily demand of 1,800 gallons per minute (gpm) across the Baylands and be able to still provide 5,000 gpm at 20 pounds per inch (psi) residual pressure to the fire hydrants.

Water conservation and recycling will be a key feature of the Baylands. The following measures are being considered for future development:

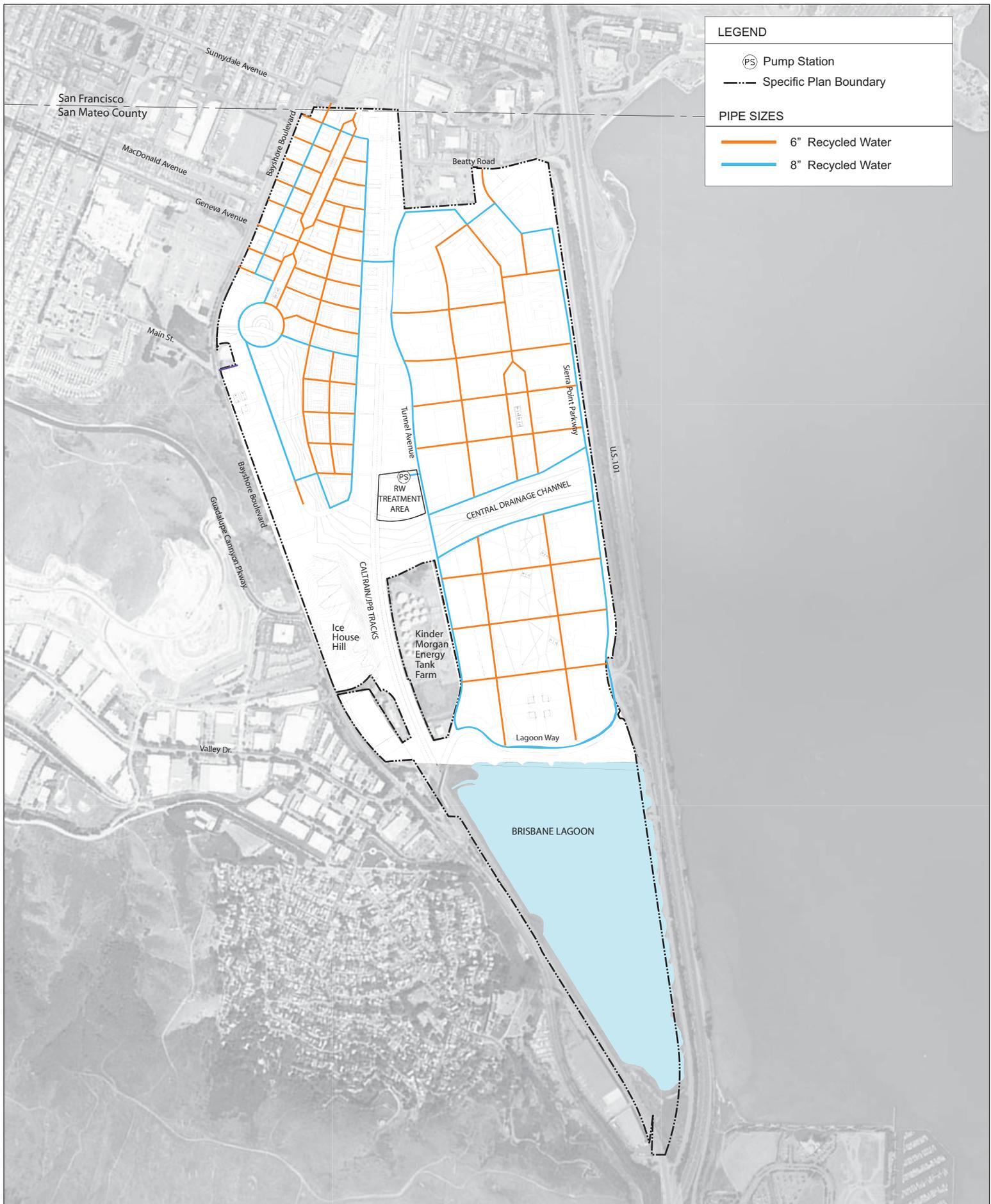
- Water budgeting and auditing
- Public education
- Efficient appliance rebates
- Multi-family unit submetering
- Water-efficient landscaping
- Water-efficient bathroom and kitchen fixtures
- Dual plumbing for recycled water
- Recycled water production from offsite sources

Depending on the levels of water conservation and the extent of the use of recycled water for dual plumbing and/or landscape irrigation, between 1,000 and 1,900 acre-feet of water will be required for future development in the Planning Area.

Policy 7-3: Water conservation methods, in addition to those required by state law, shall be incorporated into all development proposals as conditions of approval. Such measures shall include:

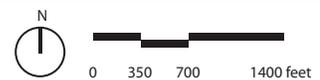
- *Use of conservation devices such as low-flow fixtures, including toilets, faucets, and shower heads;*
- *Use of low-flow irrigation systems in public rights-of-way, public parks and open space, and planting in development areas; and*
- *Use of drought-resistant plants in all landscaped areas.*

Policy 7-4: Public parks and open space shall incorporate water conservation methods and the use of recycled water to the maximum extent feasible.



Brisbane Baylands Specific Plan

7.3 Conceptual Recycled Water System



7.3.4 Offsite Water Storage and Distribution System Improvements

To maintain proper water pressure at the Baylands for new development, additional storage and properly sized interconnecting water mains and control valves are required within the City Brisbane and GVMID service areas. Icehouse Hill is the only onsite location that meets the required storage tank base elevation of about 265 feet and an overflow elevation of about 290 feet. Due to its visual prominence and recreational value, Icehouse Hill is not considered an appropriate location; instead two offsite locations are identified. Locating the new tank (North Tank) off Guadalupe Canyon Parkway would position it centrally in the distribution system, near several major potential fire flow locations. An alternative tank location (South Tank) would be in the southern part of Brisbane located near Thomas Avenue. The storage tank will be supplied by water flowing directly from the SFPUC turnouts.

7.3.5 On-site Water Distribution System

The on-site water system for the Baylands will consist of a grid of 8-inch diameter pipes surrounded by 14-inch diameter loops. To connect the landfill and railyard systems, 14-inch pipes will cross the Caltrain/JPB train tracks at two locations. Water will be delivered to the proposed on-site distribution system through two connections to the proposed 20-inch main in Bayshore Boulevard at Valley Drive and Main Street. Water service to future development will be fed from the on-site system and include meters, backflow prevention devices and flexible service connections.

An additional permanent connection to the existing Tunnel Road 12-inch SFPUC water main will be provided to loop the proposed on-site water system. Potential emergency connections to the City of Daly City water system may be provided at McDonald Avenue and Bayshore Boulevard or at the existing City of Brisbane interconnect to the Daly City water system at Main Street.

7.4 RECYCLED WATER

To support the goals of the project and to offset the increased water demand of future development, recycled water for irrigation and for building plumbing may be used at the Baylands. Currently, there is neither recycled water supply nor infrastructure available near or at the Baylands.

7.4.1 Recycled Water Demand

Recycled water may be used in irrigating open space areas, roadside planter areas and landscape water features in the Planning Area. In addition, proposed buildings may be dual-plumbed with recycled water systems serving appropriate plumbing fixtures, such as toilets and urinals. Where feasible, the open space and open areas will be planted with native and drought-tolerant species that require significantly less or no irrigation after being irrigated for the first two years for plant establishment. The largest irrigation demand will take place during the dry months of April through October, with peak irrigation demands expected in July. The recycled water demand within commercial and residential buildings will be consistent and occur throughout the year.

Based on the requirements described above, the maximum recycled water demand is estimated to be approximately 0.30 million gallons per day (MGD) for irrigation uses and 0.38 MGD for residential and commercial buildings. The combined average daily recycled water demand, inclusive of both irrigation and building plumbing demands, is estimated to be approximately 0.68 MGD.

7.4.2 Proposed Recycled Water Supply

Recycled water supply will be provided by the Water Recycling Facility (WRF), which may consist of either a mechanical scalping plant or a natural scalping plant which utilizes constructed wetlands as part of the treatment process. The WRF will provide tertiary treatment of wastewater for recycled water re-use while flow in excess of the time-dependent demand will be sent to the SFPUC's combined sewer (SFCS) line in Sunnydale Avenue for treatment at the SFPUC's Southeast Water Pollution Control Plant (SWPCP). Recycled water will be fed into the on-site distribution system, described below, via a pump(s) at the WRF.

7.4.3 Proposed Recycled Water Supply

Distribution mains for recycled water will be provided throughout the Planning Area. Pipelines will have flexible joints and connections to withstand tolerable levels of hard edge differential settlement at the interface between a proposed building and distribution mains. Depending on the project demands, the proposed system may require a storage tank sized for a single max day demand.

Policy 7-5: Investigate alternative methods and funding for sewage treatment and disposal, and give priority to alternatives that utilize water recycling or reclamation.

Policy 7-6: Encourage and support proposals for using recycled water for irrigation of landscaped areas in development districts.

7.5 WASTEWATER SYSTEM

7.5.1 Existing Collection System

7.5.1.1 Overview of Controlling Agencies and Systems

The City of Brisbane Sanitary Sewer District, which incorporates the GVMID, and the Bayshore Sanitary District (BSD) own and operate wastewater collection facilities within the Brisbane city limits. The City of Brisbane operates and maintains a network of gravity mains and laterals, force mains and pump stations to serve the Bayshore, Central Brisbane, Crocker Industrial Park, Guadalupe Canyon, and Sierra Point areas of Brisbane. BSD was created mainly to collect wastewater generated within Daly City. The district has a large overlap with Brisbane, including the undeveloped areas of the former railyard and landfill portions of the Baylands, the Brisbane Industrial Park and the Kinder Morgan Tank Farm. Both the City of Brisbane and BSD systems discharge sewer flows to the SFPUC 78-inch SFCS, at the north end of the Planning Area, which conveys the flows to the SWPCP for treatment.

7.5.1.2 Existing Sewer Facilities

Existing sanitary sewer lines serving the Industrial Way buildings and other existing or demolished buildings on the former railyard will be removed due to incompatibility with future street grid and capacity deficiencies. On the landfill, flow from the existing Tank Farm is pumped from a small lift station within the Tank Farm through a force main to the BSD line on Tunnel Avenue. Both Tunnel Avenue and its sewer line will be realigned due to the proposed street grid. Existing sanitary sewer flows from the former landfill and railyard are conveyed to the existing SFCS transmission main located in Sunnydale Avenue and underneath portions of the Recology Recycling Plant. The SFCS main then discharges to the SFPUC Box Culvert in Harney Way before conveying flow through a series of gravity and force mains to the SWPCP.

7.5.1.3 Existing System and SWPCP Capacity

SWPCP currently receives an average dry weather flow of 63 MGD, which accounts for approximately 75 percent of its available dry weather flow capacity of 85 MGD. In addition, the City of San Francisco upgraded the SWPCP wet weather flow capacity to 250 MGD in 1994 to comply with Federal regulations requiring a reduction in combined sewer overflow

discharges to the Bay. To further reduce the frequency of combined sewer overflows into the Bay and increase system capacity, the City of San Francisco is adding a new combined sewer line in Sunnydale Avenue.

Under the current contract, the City of Brisbane is allowed to convey sewer discharges to the SWPCP of up to 6.7 MGD, whereas its current sewer discharges during dry weather and wet weather conditions are approximately 0.34 MGD and 1.5 MGD, respectively. BSD has no set capacity allocation at the SWPCP based on its current contract. The established protocol dictates that if the development of the Baylands requires service for a demand greater than 200,000 gpd, then the BSD notifies the staff at the SWPCP to confirm that capacity is available.

7.5.2 Proposed Wastewater System

7.5.2.1 Proposed Sanitary Sewer Generation

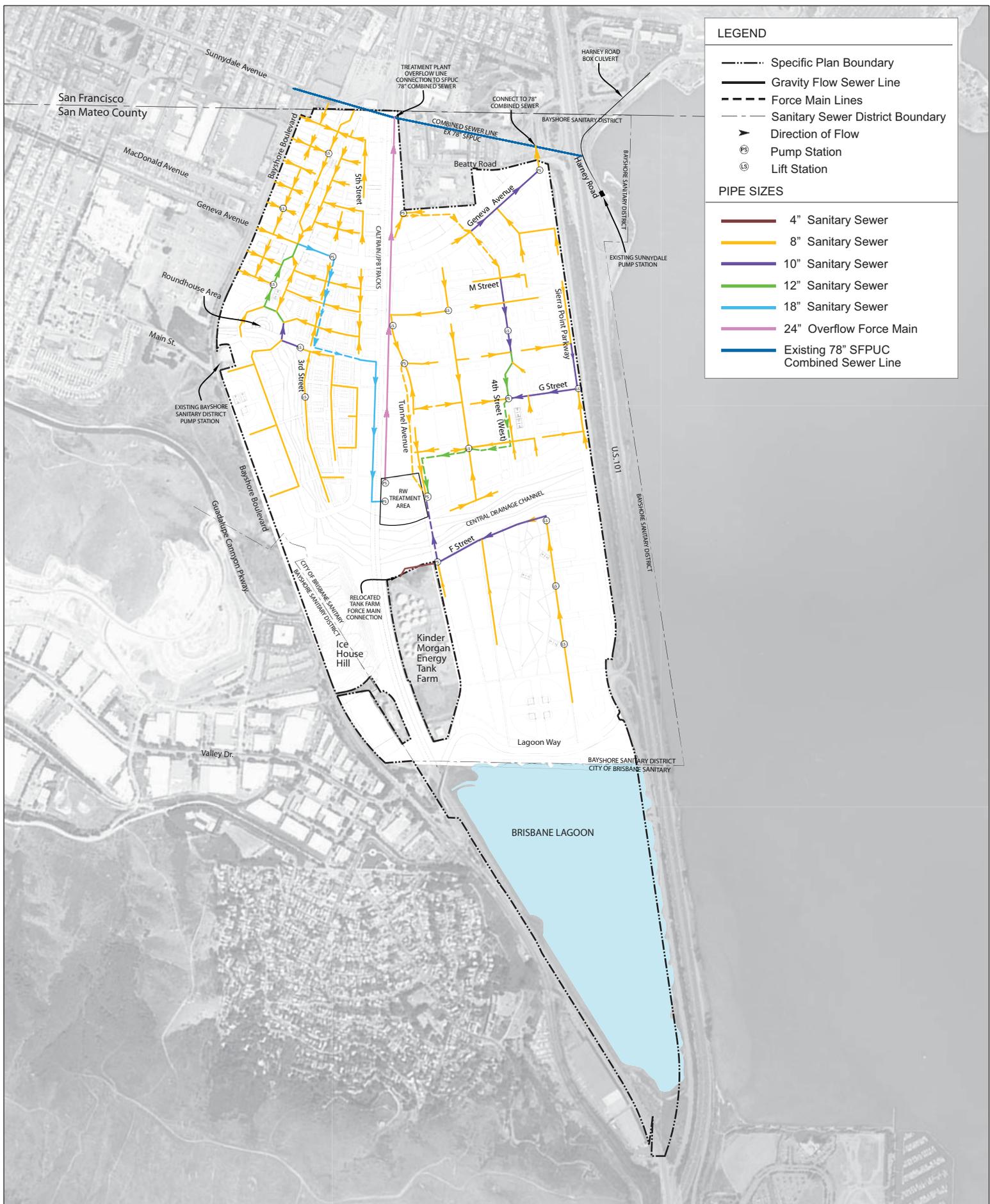
Proposed sanitary sewer demands are based on a 95 percent return rate of the average daily water demand for the individual land uses. Assuming implementation of some water conservation measures, the Baylands at full buildout will generate an approximate average daily sewage generation of 1.3 MGD and a peak daily sewage generation of 5.1 MGD.

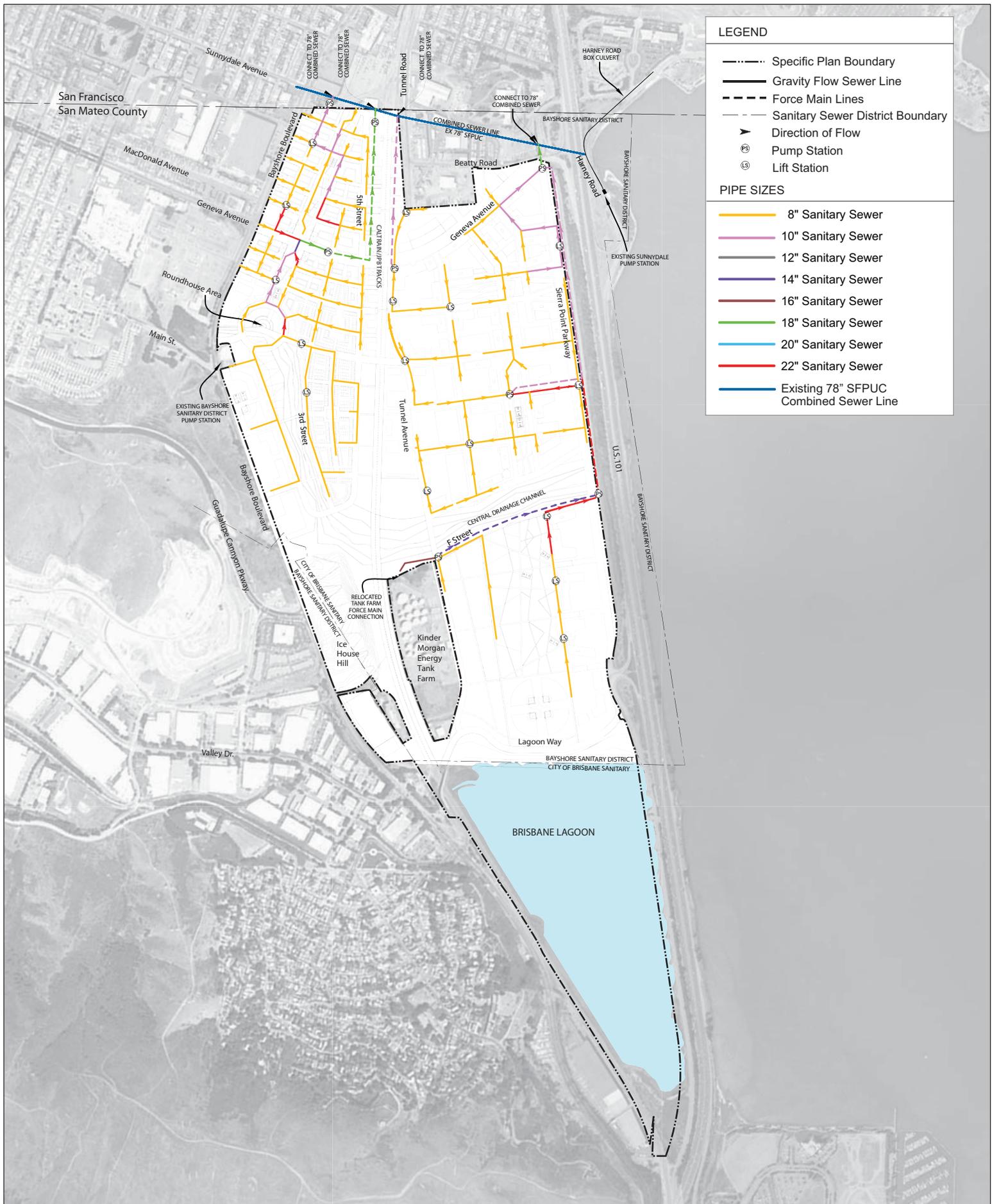
7.5.2.2 Proposed On-Site Wastewater Collection System

To accommodate existing uses and the buildout of the Baylands, the existing on-site wastewater collection system and associated facilities will be completely replaced in phases. At full build-out, the proposed wastewater collection system will be designed to meet the standards of the City of Brisbane and the Brisbane Baylands Infrastructure Plan design criteria. The construction of an on-site Water Recycling Facility (WRF), which would treat wastewater and supply recycled water for non-potable uses on the Baylands and discharge sewage in excess of the projected recycled water demand to the SFCS in Sunnydale Avenue (See Figure 7.4). Prior to the construction of a WRF, or if all necessary permits for such a facility cannot be obtained, a second option includes the construction of a conventional sewer system directly discharging to the SFCS line in Sunnydale Avenue for treatment at the SWPCP (See Figure 7.5).

Option 1: Sewer System with On-site Water Recycling Facility

Wastewater Treatment Facility - As a means of reducing the project potable water demands, an on-site WRF, capable of providing an average daily recycled water demand of 0.58 MGD with capacity to handle a maximum daily demand of 0.68 MGD, is proposed to provide a





tertiary level of treatment to sewage in order to supply recycled water for non-potable uses on the Baylands. Providing recycled water to the Baylands from off-site sources is either physically and economically infeasible, or currently not available.

Two general alternative WRF design scenarios have been developed. One scenario would include a conventional mechanical scalping plant, which would implement technology such as membrane bioreactors and vortex grit systems as part of the tertiary treatment process. The second scenario involves a natural treatment plant that uses natural scalping methods and free surface treatment wetlands.

For both scenarios, effluent in excess of recycled water demands could be sent to San Francisco via a force main to the SFCS, and ultimately, to the SWPCP. During periods of lower recycled water demands, it may be more efficient to ratchet back the volume of flow treated with “excess” raw sewage shipped north through the existing conveyance facilities. Excess effluent from the WRF could also be used to develop wetlands in the Baylands, either with or without effluent discharge to the improved Visitacion Creek. A non-discharging wetlands condition would be created either by limiting the amount of discharged effluent or by pumping excess (non-consumed) effluent from the downstream end of the wetlands back to the SFPUC system for treatment and disposal. Effluent quality from the on-site WRF generally would be suitable for discharge, but direct discharge to the Bay may be postponed or may be infeasible due to complications and potential time delays associated with obtaining a discharge permit from the SFBRWQCB. If direct discharging were to occur, the most likely outfall would be to Visitacion Creek rather than directly to the Bay. The selection of the preferred WRF option will be based on siting, environmental and economic constraints, and completed during the design and permitting process.

Proposed Wastewater Collection System - On the former railyard, wastewater will be collected and conveyed through two areas—one north of Geneva Avenue and one on the southern side of Geneva Avenue. Each area conveys wastewater flows through a series of gravity and force mains and in-line lift and/or pump stations to the on-site WRF.

On the former landfill, wastewater will also be collected and conveyed through a series of gravity and force mains and in-line lift and/or pump stations to the on-site WRF.

Option 2: Sewer System with Direct Connection to SFPUC

Proposed Wastewater Collection System - As an interim condition or a permanent alternative to collecting and distributing flow to an on-site WRF, wastewater would be collected through an on-site system for direct discharge to the SFCS. For the former railyard, wastewater will be collected by a series of gravity and force mains. With the

assistance of pump and lift stations, flow will be discharged to the SFCS at two locations within Sunnydale Avenue.

On the former landfill, wastewater will be collected by a series of gravity and force mains. With the assistance of pump and lift stations, flow will be discharged to the SFCS at two additional locations near Beatty Avenue.

At the four proposed connections to the SFCS, pump stations will be installed to force sewage out of the proposed on-site system during large storms and help prevent backflow and surcharge conditions from the SFCS. Connections to the SFCS will be negotiated with the SFPUC once detailed designs and flows are provided. The SFCS discharges to the Harney Way box culvert, where flow is then conveyed through gravity and force mains to the SWPCP for treatment.

7.5.3 Flexible Building Service Connections

Proposed building services will be fed from the on-site system and include clean-outs and flexible service connections. Flexible service connections with settlement vaults help mitigate shearing of the utility infrastructure caused by hard edge differential settlement at the interface between a proposed building and sewer lateral connection.

7.5.4 Proposed System Design and Approval Constraints

Service Agency and Detachment Process

The Baylands is currently within the BSD service area. The City of Brisbane and/or the developer may wish to pursue detaching the Planning Area from the BSD, and annexing it into the City of Brisbane's wastewater service area, and eventually accepting ownership and maintenance responsibilities for the wastewater system at the Baylands. This would allow the City more control over the development and the utilities within its boundaries. The de-annexation process can be initiated either by the owners of the properties in the Baylands or the City. The property owners or the City must submit an application, a filing fee, environmental documentation, and a petition stating their intention to the Lead Agency Formation Commission (LAFCO). Included in this application is a map and legal description of the area to be detached. LAFCO will then circulate the application package to the districts and governmental agencies affected. Public hearings must then be held to hear objections from parties affected by detachment.

Policy 7-7: Adequate sewage treatment and export capacity to accommodate development shall be reserved at the time of Specific Plan adoption.

7.6 EMERGENCY SERVICES

Goal 7.4: Police and fire protection services to the Baylands that are adequate to ensure the health, safety and welfare of future residents, employers, employees, and visitors.

7.6.1 Police

Police service to the Baylands area is currently, and will continue to be, provided by the City of Brisbane Police Department (BPD). The BPD operates out of a central station located in City Hall in downtown Brisbane, just west of the Baylands. The BPD is currently staffed by 15 sworn officers and 3 civilians. This includes one chief, one commander, four sergeants, eight patrol officers, a juvenile division/school resource officer, a community service officer, an administrative assistant, and a records clerk. The BPD protects lives and property through regular police patrols, criminal investigations, and the enforcement of laws. It also provides service to the community for crime prevention, disaster preparedness, hazard abatement, and the mediation of disputes.

BPD runs patrols on 12-hour shifts with each shift having a minimum staffing level of one supervisor and one officer. Ideally, when fully staffed, each shift has one supervisor and two officers per shift. BPD's goal is to respond to emergency calls within three (3) minutes, which it achieves more than 95% of the time, and within five (5) minutes to non-emergency calls, which it achieves more than 80% of the time.

Development of the Baylands will substantially expand the area that needs to be patrolled and served by the BPD. Given the sizes of the proposed developments, in terms of both geographic area and quantity of development, it is probable that BPD will require the addition of personnel, equipment, and potentially the establishment of a new geographical beat system to adequately serve the area. For the past 15-plus years BPD's staffing level has remained the same. However, the additional 4,343 housing units and substantial commercial uses proposed in the Baylands development will increase the residential and employment population of the City of Brisbane and therefore more emergency services will be required. Typically, police departments identify personnel needs based on an ideal number of sworn officers per 1,000 residents. As a result, the Department will need to determine a basis for projecting demand for personnel, equipment, and services that will be generated by the buildout of the Specific Plan area.

Policy 7-8: The City Planning Department will coordinate with the Police Department regarding character and timing of development so that the BPD can adequately plan for the necessary expansion of services to the Baylands area.

Policy 7-9: Additional police personnel shall be provided and the Police Department will revise its patrols as needed to establish and maintain City standards for police services to the Baylands.

7.6.2 Fire Protection

Fire protection services are provided to the City of Brisbane by the North County Fire Authority (NCFA), a Joint Powers Authority established in 2003 to serve the communities of Brisbane, Daly City, and Pacifica. The Authority delivers emergency and non-emergency services, including rapid assistance for medical, fire or other hazardous situations, to the member and contract communities from nine strategically located fire companies. The City of Brisbane is served from Fire Station #81 located at 3445 Bayshore Boulevard, just southwest of the Specific Plan Area. Station 81, whose primary response area is the City of Brisbane, is staffed by a 3-Person Type I Paramedic Engine Company.

The NCFA responds to and extinguishes hostile fires of all types, as well as to medical emergencies and calls for rescue. The NCFA's goal is to have a fire company on the scene within four (4) minutes or less travel time of having received a call, at least 90% of the time. With the strategic location of fire companies and fire stations, fire personnel normally arrive prior to other responders (ambulance, etc.) to begin emergency medical care. It is the responsibility of the NCFA to provide emergency medical services to its customers. On average, medically related responses account for 65 percent of all requests for service. To maintain a standard level of care, each engine company is staffed with paramedics and additional personnel trained and certified as Emergency Medical Technician-1 (EMT).

Daily operational staffing consists of three rotating platoons of firefighters and paramedics working 24 hours each day of the year. Platoons are commanded by Battalions Chiefs and divided into units of firefighting and rescue teams called Fire Companies. A Fire Company assigned to a pumping engine is referred to as an Engine Company, and those assigned to a ladder truck are classified as a Truck Company. A Fire Captain, for efficiency and safety purposes, supervises Fire Companies.

The NCFA has eight engines (these carry water, hose, and fire pumps), and one aerial ladder truck (this truck has a 100' hydraulic aerial ladder on top and many ground extension ladders to be placed against houses and lower buildings to help rescue trapped persons). Everyday of

the year, at least three firefighters are assigned to each of these nine pieces of firefighting equipment. Two Battalion Chiefs and one Duty Deputy Fire Chief on duty at all times to lead and supervise these emergency personnel.

Development of the Planning Area will increase the demand for fire protection and expand the geographic area within which services must be provided.

The project intent is to fully utilize the proximity of the site to Station #81 and establish roadway improvements within the Baylands to allow for the NCEFA's emergency response time standards to be met. Additionally, the potential demand for additional personnel and equipment will need to be responded to as the Baylands builds out.

Policy 7-10: The City Planning Department will coordinate with the NCEFA regarding character and timing of development so that the NCEFA can adequately plan for the necessary expansion of services to the Baylands.

Policy 7-11: Development in the Baylands shall be subject to the fire prevention and safety standards adopted by the North County Fire Authority.

The Specific Plan can accommodate facilities for additional emergency services if deemed necessary.

7.7 SOLID WASTE

Under a 15-year exclusive agreement with an additional 10-year option, Recology, previously known as South San Francisco Scavenger Company, provides solid waste collection and recycling services for the City of Brisbane. The Planning Area is located within Recology's franchise area and will receive service from Recology throughout the build-out of the Baylands. The land uses in the Baylands include retail, hotel, office, housing and warehouse land uses, which will generate approximately 58 tons per day and 21,060 tons per year of solid waste.

In an effort to reduce the impact on landfill capacity, an on-site recycling program will be implemented at the Baylands. The implementation of a recycling program has the potential to reduce the expected waste generation rates and may include the following components: composting using source-separation containers, recycling containers for each building and in open space areas, and a public awareness and education program.

Refuse collected from the Baylands will be initially transported to the Blue Line Transfer Material Recovery Facility in South San Francisco for sorting of recyclables and processing prior to transport for disposal. The Blue Line Transfer Facility is approximately ten years old and utilizes state of the art equipment, resulting in efficient sorting and disposal processes. It is designed to handle 4,300 tons per day of waste and permitted for handling a capacity of 2,000 tons per day. Blue Line currently processes 1,200 tons per day. The excess capacity at the facility is capable of processing the solid waste loads generated at the Baylands.

Currently, the Blue Line facility diverts approximately 25 percent of the incoming refuse for recycling. In addition, residential and commercial customers use source-separated containers to sort recyclables. Because of plant efficiency and its recycling program, Brisbane is able to divert more than 60 percent of waste stream away from landfill disposal. A newly implemented construction and demolition sorting line is achieving a diversion rate of 65 to 85 percent for incoming construction and demolition debris.

Upon completion of sorting, the remaining waste will be delivered to the Ox Mountain landfill in Half Moon Bay. Ox Mountain landfill has a remaining capacity of at least 10-15 years, at which time waste will be diverted to other landfills, such as the Potrero Hills landfill, contracted with Recology where additional capacity is available.

Policy 7-12: All construction operations and Baylands businesses shall participate in the City's recycling programs in order to minimize the amount of solid waste that needs to be disposed of in landfills.

Policy 7-13: The proportion of the Baylands's waste stream that requires disposal in a landfill shall not exceed that of the City of Brisbane as a whole.

7.8 DRY UTILITY SYSTEMS

7.8.1 Electrical System

7.8.1.1 Existing Electrical System

The existing distribution system on the Baylands is a mix of underground cables and overhead lines. Existing electrical infrastructure serving existing properties are primarily located within Tunnel Avenue. The existing Pacific Gas and Electric (PG&E) underground electrical facilities will continue to serve the Kinder Morgan Tank Farm, which is located adjacent to and contained by the Baylands. Along the northern portion of Tunnel Road within the landfill, PG&E overhead electrical lines serve the existing Sierra Lumber Yard

and Van Arsdale properties. Additional overhead electrical lines extend from the area between the City of Brisbane Fire Station and Icehouse Hill to Bayshore Boulevard. Existing electrical facilities serving the Caltrain railroad tracks will remain in service and undergrounded or relocated where necessary. In addition, an existing 230 kiloVolts (kV) underground electrical feeder is also located underneath Bayshore Boulevard and connects into the existing PG&E Martin Substation at the corner of Geneva Avenue and Bayshore Boulevard.

7.8.1.2 Proposed Electrical System

Proposed Electrical Demand

The anticipated electrical load at the buildout of the Baylands is approximately 67.74 mega-voltage amperes (MVA).

Off-Site Electrical System Distribution System Upgrades

Proposed electrical utility on-site infrastructure will be fed with a 21 kV loop system. One end of the system loop will feed the Baylands with a 21kV line from the PG&E Martin Substation and installed underground in a combined joint trench. Based on an initial review, PG&E has indicated that there may be adequate capacity at its existing Martin substation located on Geneva Avenue between Bayshore Boulevard and Sherwin Avenue. If the final design exceeds the designed capacity at the Martin Substation, PG&E would be required to install one or two new circuits, which will provide the additional current needed to serve the Baylands. The second circuit will serve the Planning Area with a 21kV feed from the existing Bayshore Boulevard primary power lines south of the Baylands and be installed in an underground trench running parallel to Bayshore until it reaches the proposed Baylands connection point.

If the demands exceed the capacity at the Martin Substation with the installation of two new circuits, the development of the Baylands may require installation of a new substation on the Baylands and purchase of wholesale power from PG&E at a reduced rate. Under this scenario, the Baylands would act as its own utility provider. The extent of required off-site infrastructure upgrades to serve the Planning Area will be finalized during the PG&E application and design process.

Electrical System Distribution

Proposed on-site electrical supply lines will be installed in a joint trench with the gas and communications infrastructure described below. Installation of the proposed electrical lines will correspond with the phasing plan for the proposed roadway and building construction. Transformers, switches, and primary and secondary boxes will be designed and installed throughout the Baylands as required by the land uses. Based on the final Tunnel Road alignment and future land uses, the existing overhead line will be undergrounded or located

in an underground joint trench elsewhere in the Planning Area. In addition, overhead lines running through Icehouse Hill and along Bayshore Boulevard may require undergrounding to comply with PG&E Rule 20. The final designs and composite plan will be coordinated with PG&E during the design process.

On-site Solar Farm

Supporting the vision for Baylands as a sustainable community, installation of an on-site solar farm will allow future development at the Baylands to meet portions of its electricity demands, particularly during peak use period, via a renewable source. The solar farm, which will consist of arrays of ground-mounted photovoltaic panels, will harvest the sun's energy for on-site use and substitute for fossil fuels, which is a less expensive (in the short term) but greenhouse gas-intensive source of energy. Integration of the solar farm into the infrastructure at the Baylands can be achieved by creating a grid of electrical infrastructure and potentially a substation, independent of the PG&E facilities, to directly serve on-site users. Alternatively, the developments on the Baylands could potentially tie into the proposed on-site PG&E system via an interconnect to the adjacent Martin Substation. Final designs for the solar farm will be based on analysis and consideration of siting, infrastructure and available financing and incentive programs.

7.8.2 Natural Gas System

7.8.2.1 Existing Natural Gas System

PG&E maintains an existing underground 6-inch gas main in Tunnel Avenue, which begins at the southern edge of the Sierra Lumber Parcel and continues north where it taps into an existing 24-inch PG&E natural gas transmission main in Bayshore Boulevard. The 6-inch gas line currently serves both the Sierra Lumber and Van Arsdale properties within the Planning Area and other properties north of the Baylands. Based on proposed uses and roadway alignments, the Tunnel Avenue gas main will be removed or relocated.

7.8.2.2 Proposed Natural Gas System

Natural Gas Demand and Supply

Based on the proposed uses and square footages, PG&E estimates a total natural gas load of 160 mcfh (thousand cubic feet per hour at standard conditions). Based on discussions with PG&E, existing facilities are able to supply the necessary supply capacity to serve the Baylands development.

Natural Gas Distribution

To provide the required demands, PG&E proposes using a high pressure tap to connect into the existing 24-inch gas transmission main in Bayshore Boulevard. Two sub-surface regulation pits will be constructed on site near the tap and act to reduce the pressure of the gas arriving from the high pressure main so that it operates at a pressure safe for distribution to residential and commercial customers. During the design process, PG&E will review the potential alternative of constructing a back-tie between the existing 24-inch gas line in Bayshore Boulevard and an existing gas main south of the Planning Area along U.S. 101. The back tie would eliminate the need for the two proposed regulator pits near the connection to the existing 24-inch gas main in Bayshore Boulevard.

The new natural gas distribution system will be designed and constructed to PG&E standards with 4- or 6-inch pipelines. Proposed distribution lines serving the individuals buildings will be constructed in a combined joint trench with electrical and communications facilities. The final designs and composite plan will be coordinated with PG&E during the design process.

7.8.3 Communications Infrastructure

The existing telecommunications facilities within the Baylands will be evaluated to determine their condition. Removal and replacement of the existing facilities may be required as part of the future development.

Proposed telecommunications infrastructure, including telephone, cable and high-speed fiber optics, will be installed in an underground combined joint trench with proposed electric and gas facilities. Both AT&T and Comcast Cable currently serve the surrounding area beyond the Baylands. AT&T and Comcast Cable will be coordinated to provide service to the Baylands during the design stages of the future development projects.

Policy 7-14: In order to minimize visual impact on the area, all existing and future utilities shall be placed underground, where feasible.