07
INFRASTRUCTURE

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7.1 PURPOSE AND OVERVIEW

This chapter describes the grading, stormwater, potable water, sanitary sewer, recycled water, energy and telecommunications infrastructure improvements within The Baylands.

Earthwork, soil remediation and utility infrastructure improvements are needed for development of The Baylands. These site improvements are designed to comply with the General Plan and principles of the Sustainability Framework in Chapter 04.

To address the General Plan goals, The Baylands' earthwork, storm drainage and site remediation primarily use current best practices to provide a safe and resilient site. Utilities, including water supply, sewage management and energy systems, incorporate technology and performance monitoring to provide sustainable infrastructure to support safe development of the site.

Infrastructure in the public realm, including open spaces, open areas and streets, are designed as a synthesis of the grading and utility infrastructure designs and locations, lighting, planting, furnishings, habitat, ecology and connectivity improvements to enhance the character and dynamic goals of The Baylands. The Baylands Infrastructure Report provides a detailed description of the environmental, geotechnical, and infrastructure summarized herein.

7.2 INFRASTRUCTURE GOALS

The Baylands' infrastructure is guided by the following General Plan goals, as well as the principles of the Sustainability Framework for The Baylands as described in Chapter 04. These goals are designed to promote a safe, resilient and sustainable site.

GOAL 7.2.1: DEVELOP A RESILIENT SITE, RESPONSIVE TO CLIMATE CHANGE AND ASSOCIATED HYDRAULIC CONDITIONS

This goal addresses the following General Plan requirements:

- *"Development shall be designed to protect uses from the 100-year flood, including 100 years of projected sea level rise as determined based on regulatory standards or guidelines in effect at the time of project construction, with the reference to guidelines and sea level rise projections approved by the Director of Public Works/City Engineer based on context-specific considerations of risk tolerance and adaptive capacity." (GP-1-18, 3(J))*

To develop a resilient site, grading standards and adaptive approaches are established for buildings, roadways and open space area in this Specific Plan to address risk-based sea level rise (SLR) and associated flooding potential. Consistent with the Baylands program Final EIR (2015) mitigations (4.H-4a and 4H-4b), these measures include increasing site elevations at key locations to ensure the lowest finish floors of all new structures will remain at least one foot above 100-year storm event hydraulic grade line inclusive of the projected year 2100 Medium-High risk SLR.

GOAL 7.2.2: PROMOTE CREATION OF A SAFE SITE THROUGH EARTHWORK AND SOILS REMEDIATION

This goal addresses the following General Plan requirements:

- *"The single specific plan and development agreement subject to City review and approval referenced above shall include:*

  (i) detailed plans for Title 27 compliant closure of the landfill and Remedial Action Plans (RAPs)

for OU-1 and OU-2 that have been approved by all appropriate regulatory agencies, which include, but shall not be limited to, CalRecycle, the San Mateo County Environmental Health Department, the California Department of Toxic Substances Control, the California Regional Water Quality Control Board

(ii) a specific schedule establishing time frames by which (i) the landfill must be closed in full compliance with Titles 27 and (ii) the remediation of OU-1 and OU-2 must be completed; and

(iii) specific means by which the City may enforce the applicant's adherence to the schedule for closure and remediation and specific consequences, e.g., monetary penalties, suspension of building permits, etc., that the City may impose on the applicant for failing to adhere to the schedule." (GP1-18, 3(A))

and:

- *"All residential development shall be designed and remediated to accommodate ground level residential uses and ground level residential-supportive uses such as daycare, parks, schools, playgrounds, and medical facilities." (GP-1-18, (3C))*

and:

- *"Sufficient assurances for the satisfactory ongoing performance of site remediation and site development (e.g. site monitoring, performance bonds, environmental insurance) shall be provided as determined by the City." (GP-1-18, 3(F))*

and:

- "Prior to issuance of a grading permit to export soil or move soil from the existing landfill area for incorporation in a remediation or grading plan, the soil shall be tested in a manner approved by the City." (GP-1-18, 3(K))

OU-SM was previously known as OU-1 and is subsequently named by California Department of Toxic Substances Control (DTSC) as "OU-SM" and is indicated as such herein.

To promote a safe site for all planned uses, Feasibility Study/Remedial Action Plans (RAPs)[1,2], have been developed and approved by the applicable regulatory agencies. A Landfill Closure and Post-Closure Maintenance Plan[3] has been submitted to the Regional Water Quality Control Board and the County of San Mateo for approval. Adherence to the remediation efforts is overseen by the applicable regulatory agencies in conformance with Chapter 6.8 of the California Health and Safety Code. The landfill closure and post closure maintenance plans are overseen by the applicable agencies pursuant to Title 27 of the California Code of Regulations. The phasing schedule of remediation activities is described in Section 9.2 – Phasing.

GOAL 7.2.3 PROTECT AND ENHANCE SURFACE WATERS

This goal addresses the following General Plan requirements:

- *"Require erosion controls to mitigate soil disturbance" (General Plan, Policy 129)*
- *"Reduce the amount of sediment entering waterways." (General Plan, Policy 133)*
- *"Reduce the amount of pollutants entering waterways." (General Plan, Policy 134)*

To protect and enhance surface waters, stormwater protection and treatment in conformance with the National Pollutant Discharge Elimination System (NPDES) Municipal Regional Stormwater Permit standards adopted by San Francisco Regional Water Quality Control Board (SFRWQCB) with authorization of the United States Environmental Protection Agency are required during soil-disturbing construction activities and future operation of the Specific Plan area once developed. The requirements of a Stormwater Pollution Prevention Plan (SWPPP) will be adhered to during the construction phase. Developed

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1 Geosyntec, Feasibility Study/Remedial Action Plan (FS/RAP) for the San Mateo County Portion of Universal Paragon Operable Unit (UPC OU-SM) (October 11, 2021)

2 Geosyntec, Feasibility Study/Remedial Action Plan (FS/RAP) for the Brisbane Baylands Operable Unit 2 (OU-2) (December 22, 2021)

3 ENGEO, Closure and Post-Closure Maintenance Plan – Brisbane Baylands Landfill (December 8, 2021, revised November 16, 2022) (pending agency approval)

areas include treatment of runoff from pollution-generating surfaces and use of Low Impact Development (LID) techniques to mimic natural stormwater runoff and provide filtration prior to release of stormwater into the surface waters of Visitacion Creek, the Brisbane Lagoon and the San Francisco Bay.

GOAL 7.2.4: SUPPORT SUSTAINABLE WATER SUPPLY AND USE

This goal addresses the following General Plan requirements:

- *"A reliable water supply approved by the City of Brisbane to support purposed uses within the Baylands shall be secured prior to site development." (GP-1-18, 3(B))*
- *"Encourage conservation of domestic water." (General Plan, Policy 138)*

To support sustainable water supply and use, The Baylands water supply and demands identified in this chapter identify a secure source of water. Water use at The Baylands complies with water conservation and recycling measures in the Sustainability Framework described in Chapter 04.

GOAL 7.2.5: PROMOTE ENERGY CONSERVATION

This goal addresses the following General Plan requirements:

- *"Promote the conservation of non-renewable energy resources" (General Plan, Policy 139)*
- *Encourage energy-efficient building design and site planning." (General Plan, Policy 140)*

The Baylands achieves these goals by requiring on-site generation and storage of renewable electricity and the use of renewable electricity supplied by Peninsula Clean Energy, as well as limiting the use of natural gas, as described in Section 7.9 of this chapter. The Baylands will also include all-electric, efficient building design and the site plan includes sustainability features, including active transportation, transit strategies and Development Standards as outlined in Chapter 04 Sustainability Framework.

7.3 GRADING AND GEOTECHNICAL

7.3.1 SUMMARY

The Baylands topography varies across the site[4], with elevations at Visitacion Creek being the lowest, and at Icehouse Hill, the highest. Approximately 2.9 million cubic yards of soil will be removed from the East Side and transferred to the West Side. This volume of soil is necessary to establish finished pad and road elevations to comply with the approved remediation and landfill closure plans and to address settlement, storm events, SLR and flood risks. Earthwork is expected to occur within The Baylands with no import or export of materials to or from off-site locations.

Required remediation applies to the West Side and Title 27 landfill closure activities. On the West Side, remediation requirements for two areas (OU-SM and OU-2) are set forth in RAPs approved by the DTSC and the SFRWQCB, respectively.

On the East Side, waste disposal occurred over a period of decades, resulting in a net increase of approximately 12.5 million cubic yards of non-hazardous waste. Following the end of landfill activities in the late 1960s until 2017, the site was used for soil recycling purposes. During that period, approximately 5 million cubic yards of soil was imported to the East Side. The CPCMP has been submitted to the SFRWQCB and the County of San Mateo for approval.

7.3.2 EXISTING GEOTECHNICAL CONDITIONS[5,6]

Historically, the majority of The Baylands was part of the San Francisco Bay and consisted of open water marshlands and mud flats.

By 1935, fill on the West Side included soil, rock and rubble and some debris from the 1906 San Francisco Earthquake, placed on most of the area between what is now Bayshore Boulevard and Tunnel Avenue.

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4 BKF et all, The Baylands Infrastructure Report (April 8, 2022, revised January 2023), Appendix A

5 ENGEO, Final Landfill Closure Geotechnical Report, Brisbane Baylands Landfill (December 8, 2021, revised May 19, 2022)

6 ENGEO, Geotechnical Exploration, Brisbane Baylands, Railyard (March 31, 3021, revised January 21, 2022)

This portion of the site (west of the JPB corridor) is underlain by roughly 6 to 22 feet of this variable undocumented fill overlying Holocene Bay Deposits. These deposits include a layer of compressible clay (locally known as Young Bay Mud) up to 50 feet thick.

The East Side of The Baylands is underlain by a 3-to 70-foot-thick layer of fill. Underneath the fill is a 15- to 35-foot-thick layer of waste that was placed between the early 1930s and 1967, when the area was used as a Class III landfill. The waste is underlain by Holocene Bay Deposits that include a 20- to 60-foot-thick layer of Young Bay Mud.

A layer of Pleistocene aeolian, alluvial and marine deposits up to 200 feet thick underlies the Holocene Bay Deposits on both the West Side and the East Side. The soil overlies bedrock of the Franciscan Formation that is typically composed of interbedded mélange matrix and siltstone/ sandstone.

Shallow groundwater is present throughout the site. With the modeled SLR, groundwater levels on the East side of the project are projected to decrease as a result of the landfill closure designs and to increase on the West Side of the site by up to two feet.[7]

7.3.3 GEOTECHNICAL ISSUES

Geotechnical-related development issues within The Baylands are common in the San Francisco Bay area[8,9]. These geotechnical issues include:

- *Potential seismic-induced settlement of existing fill and native deposits and potential building foundation and slope failures associated with liquefaction*
- *Long-term consolidation settlement of the soft and highly compressible Young Bay Mud*
- *On-going settlement due to the compression/ decomposition of the waste layer on the East Side*

Static settlement of the Young Bay Mud and waste material on the East Side has been reduced due to the ongoing compression/decomposition of the waste and consolidation and Young Bay Mud layers provided by the weight of long-term storage of millions of cubic yards of fill above the waste layer.

To address these geotechnical conditions at The Baylands, geotechnical stability[10] of buildings, and settlement sensitive infrastructure in The Baylands shall be achieved through performance of the following:

- *Ground stabilization shall be performed through surcharging underlying waster and compressible soils using temporary soil embankments with wick drains, or Deep Soil Mixing (DSM).*
- *Ground stabilization to densify potentially liquefiable soil shall be performed using Deep Dynamic Compaction (DDC), Deep Power Compaction (DPC), Drilled Displacement Columns, vibro-compaction, stone columns, rammed aggregate piers or DSM.*
- *Compensation Loading with Lightweight Fill shall be implemented by removing existing fill and replacing it with a lightweight cellular concrete (LWC) as a means to compensate the load being added (either by adding new fill or a relatively light structural load). Cellular concrete is a cement and water mixture mixed with a stable foam to create a low-density material that cures in place without compaction.*
- *Foundation designs for new buildings either shall be constructed directly on stabilized ground meeting state building code requirements or shall be supported on deep foundation systems, such as driven concrete piles, auger caste piles or drilled shafts that derive support in competent soil beneath the liquefiable soil and compressible Young Bay Mud. The foundation type will be based on final stabilized conditions at the time of construction.*
- *Settlement sensitive surface improvements, such as paving, sidewalks, parks and open space infrastructure and utility infrastructure shall be designed with strategies in response to anticipated settlement.*

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7 Geosyntec, Groundwater Modeling to Evaluate Potential Influence of Sea Level Rise on Groundwater Levels The Baylands (3/23/2022)

8 ENGEO, Final Landfill Closure Geotechnical Report, Brisbane Baylands Landfill

9 ENGEO, Closure and Post-Closure Maintenance Plan – Brisbane Baylands Landfill

10 Geotechnical stability refers to the ability of underlying and surrounding soil to support building foundations and/or related improvements for long-term static performance and during expected short term seismic events based on the current building code

7.3.4 SITE REMEDIATION

Site grading is also designed to meet applicable remediation requirements (for the West Side) described in the RAPs and landfill closure requirements (for the East Side). The Remedial Action Plans for OU-SM and OU-2 were approved by the applicable regulatory agencies, including completion of CEQA documentation, and the Title 27 Landfill Closure Plan has been provided to the agencies for review and approval. The following is a summary of the grading approaches outlined in these documents:

- *West Side (OU-SM and OU-2): Five feet of soil meeting environmental agency-approved clean soil standards or hardscape, such as building foundations or asphalt/concrete paved areas, must be placed above any residual legacy conditions as the surface for new building, street, park and other development uses.*
- *East Side: A landfill cover must be completed over legacy conditions, as specified in the landfill closure plan and in accordance with the Title 27 landfill closure review and approval process.*
- *Sitewide: Underground utilities will be placed within "clean soil corridors" that will underlie the width of utility corridors to sufficient depths to prevent exposure to contaminated soils during maintenance and repair activities. Soil corridors will be constructed of material meeting environmental agency-approved soil standards.*

7.3.5 FLOOD RISK AND SEA LEVEL RISE

The existing site is susceptible to flooding associated with a 100-year storm event. Mitigation or accommodation is required to address flooding based on existing conditions and projected climate change impact of SLR.

The Baylands is designed to accommodate projected SLR through a combination of permanent SLR designs and adaptive approaches that allow the infrastructure to be adjusted over time in response to measured SLR. The minimum design elevations for the development areas are informed by the projected future SLR estimates for San Francisco Bay as defined by State of California Sea-Level Rise Guidance, 2018 Update (SLR Guidance), published by the Ocean Protection Council and California Natural Resources Agency in context with tidal conditions. The SLR Guidance identifies the following SLR estimates for the San Francisco Bay near the site:

- *2050 Medium-High Risk Aversion (1:200 Chance): 1.9-feet (~23 inches)*
- *2100 Medium-High Risk Aversion (1:200 Chance): 6.9-feet (~83 inches)*
- *2050 Low Risk Aversion (<1:2 Chance): 1.1 feet (~13 inches)*
- *2100 Low Risk Aversion (<1:2 Chance): 3.4 feet (~41 inches)*

To address flooding and sea level risks, the following grading and building design criterion apply:

- ***New buildings and the reconstructed Roundhouse:***

  (i) Lowest finished floors – one foot of freeboard above 100-year storm event with tidal flow and SLR for 2100 Medium-High Risk Aversion Scenario, or

  (ii) If below one-foot freeboard, be designed to allow entrances and interior spaces to be protected for occupants to enter and leave buildings.

  (iii) Where development parcels are parallel to the Caltrain right-of-way or are adjacent to existing conditions that are proposed to remain, such as existing properties along Bayshore Boulevard, the US 101 freeway, and Tunnel Avenue, building entrances fronting these rights-of-way or on proposed street blocks transitioning to the existing streets are proposed to conform to existing grading conditions at the time of construction. Basements without access are acceptable below the 1-foot of freeboard above the 100-year storm event HGL water elevation with tidal flow and estimated SLR for the 2100 Medium-High Risk Aversion estimate.

- ***New Streets:*** *All new streets within the Baylands will be constructed to contain stormwater within the roadways during a 100-year storm event including SLR for the 2100 Medium-High Risk scenario, except for grade adjustments required to connect to existing streets at Tunnel Avenue, Lagoon Road, Beatty Avenue, Sierra Point Parkway, Industrial Road, and Bayshore Boulevard.*

Where streets serve proposed finished floor elevations for new buildings within the transition between proposed and existing grades, which are below one foot of freeboard standard, grades will be adjusted to provide access to the existing buildings and may require adaptations, such at-grade adjustments and pump stations, to respond to adjacent development and future SLR. As settlement varies across the site, freeboard provisions for waste settlement are based on the anticipated settlement for a given location and adjacent building finished floor elevations.

- ***Historical Structures:*** *Where feasible, modifications to historical structures will be completed to elevate lowest finish floors at least one foot above the 100-year storm with tidal flows and Medium-High risk SLR. Where this is not feasible, adaptive strategies, including floodproofing, will be used.*

- ***Open Space Areas:*** *Newly constructed public parks and publicly accessible open space included in the associated acreage calculations, shall meet the one-foot freeboard standard with 2050 Medium-High Risk Aversion SLR except as appropriate to safely transition to designated open space maintained at existing grades and created wetlands at Brisbane Lagoon and along the side slopes of Visitacion Creek.*

- ***Visitacion Creek:*** *Visitacion Creek conveys stormwater runoff and is graded to maintain a path for overland flow from the culverts within the JPB corridor to the culvert beneath U.S. Highway 101. Subject to inundation by SLR, the Creek's bottom and side slopes support intertidal wetlands and create a transitional or ecotone slope between the tidal and freshwater wetlands up to elevation of approximately 13.6 to 17 feet.*[11] *Created freshwater wetlands are designed to accommodate the "low risk aversion" category of SLR Guidance, thus these areas are graded to protect against the estimated SLR for the 2100 Low Risk Aversion estimate of approximately 41 inches. This Visitacion Creek design establishes salt marsh migration and transition areas that are separated from the freshwater wetland areas by a seepage berm.*

- ***Brisbane Lagoon:*** *The north shoreline of Brisbane Lagoon integrates with Lagoon Park to blend landscaping, habitat and hydrology design solutions. Lagoon Park will be graded with low lying areas for wetland creation. As these low-lying areas fall under the "low risk aversion" category of SLR Guidance, tidal flats and marsh areas are graded to protect against the estimated SLR for the 2100 Low Risk Aversion estimate of approximately 41 inches. At the northern edge of Lagoon Park, stormwater treatment is placed closer to Lagoon Road at higher elevations above the 100-year storm event hydraulic grade line, as described in Stormwater Section 7.4.*

- ***Stormwater Detention Area:*** *The stormwater detention area is proposed between the JPB corridor, Tunnel Avenue, the Kinder Morgan Tank Farm and the independent parcels for the potential on-site water storage and the WRF. This area is graded with a bottom elevation of approximately 1.5 surrounded berms on three sides set at elevations-based future 100-year storm event hydraulic grade line elevation with tidal flow and estimated Year 2100 Medium-High Risk SLR This area has been sized in response to the hydraulic modeling criteria for the Baylands and connects to Visitacion Creek. The Stormwater detention area will be isolated from tidal influence at the Tunnel Avenue crossing.*

- ***Existing Adjacent Properties:*** *Properties adjacent to The Baylands but not part of the Specific Plan, including, for example, the Kinder Morgan Tank Farm ("Tank Farm"), the JPB corridor, City of Brisbane Public Works Yard, Bayshore Sanitary Pump Station and an adjacent property, and Golden State Lumber, are either or partially below future 100-year storm event hydraulic grade line elevation with tidal flow and estimated Year 2100 Medium-High Risk SLR. Existing buildings on these sites will remain at their current elevations with property access provided at the existing grades of these sites. These properties will require measures by others to adapt to future conditions.*

7.3.6 THE BAYLANDS GRADING SEQUENCE

Grading activities will be phased and start with site preparation, including demolishing existing structures, removing existing underground utilities, and clearing and grubbing the surface soil. Site grading will comply with

11 Elevations in this chapter are based on the North American Vertical Datum of 1988 (NAVD88) unless otherwise indicated. In The Baylands at the time of the writing of this Specific Plan NAVD88 Elevation 0 converts to Mean Sea Level elevation 3.31.

applicable remediation (West Side) and landfill closure (East Side) requirements.

To achieve conceptual proposed finished grades on the East Side, the mass grading operation is anticipated to involve approximately 4,300,000 cubic yards of cut and approximately 1,800,000 cubic yards of fill. This has a total net export of approximately 2,500,000 cubic yards of fill. Upon completion of soil export activities to the East Side, geotechnical improvements and Title 27 landfill closure implementation will occur on an area-by-area basis. The remaining 1,800,000 cubic yards of soil will be moved and graded in support of the landfill closure process and mass grading on a phased basis. Mass grading activities will commence in the Sustainability District of the East Side and proceed to the created wetlands, stormwater, and wastewater treatment and recycling facilities in the Visitation Creek area. Then, mass grading continues in the sustainable infrastructure district at the southeast area of the site. The last area to be graded for development purposes following landfill closure is the East Campus Area, which is Phase 2 of The Baylands development.

To achieve conceptual proposed finished grades on the West Side, the mass grading operation will include approximately 10,000 cubic yards of cut and approximately 2,450,000 million cubic yards of fill. This earthwork results in a total net import of approximately 2,440,000 cubic yards of fill. Fill and surcharge operations on the West Side will commence on a phased basis from South to North. At a District level, active remediation will first commence at the Icehouse District followed by fill and surcharge activities. Remediation followed by fill and surcharge activities will then commence at the Roundhouse District, to be followed by remediation and then fill and surcharge at the Bayshore District.

Due to potential soil loss upon completion of the soil surcharging program on the West Side and earthwork operations, grading operations may require an additional 460,000 cubic yards of soil import from the East Side, which would include the 60,000 cubic yards of export anticipated in the mass grading analysis. Pad grades on the East Side would be lowered in response to the additional export to the West side by approximately 1-2 feet.

Combining the mass grading earthwork and soil surcharge import volumes for the West Site, earthwork operations include the export of approximately 2,900,000 cubic yards of soil from the East Side to the West Side during mass grading operations. Import or export of fill material into or outside of The Baylands is not anticipated.

7.3.7 THE BAYLANDS GRADING CONCEPT

THE EAST SIDE

On the East Side, finished pad and open space grades vary between elevation 20 and 51 feet at construction and prior to settlement occurring, with some grades set lower to match existing grades. Roadway grades generally range between elevation 12 and 58 feet, and release towards the following areas:

- *The Brisbane Lagoon, which will remain at the current elevation*
- *The Caltrans drainage channel adjacent to U.S. Highway 101, which is at lower elevations and will not be modified*
- *The restoration of the Visitacion Creek park area, which will result in bottom of creek elevations varying from approximately 3 feet at the Tunnel Avenue undercrossing to elevation -1 feet at the Sierra Point Parkway undercrossing*
- *Tunnel Avenue and Beatty Avenue*

THE WEST SIDE

On the West Side, finished grades will vary from higher than elevation 190 feet at Icehouse Hill to elevation 9 feet at the lowest point along Bayshore Boulevard. The Bayshore and Roundhouse District areas north of the Roundhouse generally slope from high points along Baylands Boulevard Avenue at Geneva Avenue to the west along Bayshore Boulevard. South of the Roundhouse in the remaining Roundhouse District, and Icehouse Hill District, finished grades generally slope from the southwest near Icehouse Hill to the railroad tracks. Overland release for proposed development parcels at The Baylands is provided through site streets, open spaces, the railroad tracks and Visitacion Creek to the east of the railroad tracks.

7.3.8 GRADING AND GEOTECHNICAL CRITERIA

Grading for The Baylands shall implement solutions to address the following:

- *Earthwork shall comply with an approved NPDES General Construction Permit through implementation of approved site-specific SWPPP.*
- *Grading shall conform to requirements of an approved Soil and Groundwater Management Plan.*
- *Grading shall adhere to requirements of approved Remedial Action Plans (West Side) and Landfill Closure and Post-Closure Maintenance Plan (East Side).*
- *New buildings, historic buildings, and publicly and non-publicly accessible open space areas shall be graded consistent with Section 7.3.4*
- *All manufactured slopes within The Baylands shall be designed with a factor of safety against failure of at least 1.5 for static loading during a seismic event and lateral deformation that does not exceed 6 inches where future buildings are planned.*

7.4 STORMWATER

Stormwater infrastructure described here is designed to support protection of the site and surface waters and create a sustainable system of storm and surface water infrastructure to serve The Baylands. The Baylands Infrastructure Report provides a detailed description of the storm drainage system.[12]

7.4.1 OVERVIEW

The Baylands storm drainage and surface water designs emphasize a combination of built and naturalized stormwater infrastructure including LID techniques and filtration-based stormwater treatment. The realigned Visitacion Creek serves as the centerpiece for the on-site portion of the Bayshore basin and includes stormwater detention, created wetlands and habitat areas to serve the larger Baylands Specific Plan Area open space network.

12 Ibid

7.4.2 THE BAYLANDS STORM DRAINAGE

The 520 acres (including 26 acres lost to future SLR) of developable land of The Baylands is located within three existing drainage areas:

- *Bayshore (422 acres)*
- *Brisbane Lagoon (52 Acres)*
- *Beatty Avenue (46 acres)*

The existing conditions and planned improvements for each of the three basins are discussed in the following sections (refer to Figure 7.1 for the existing storm drainage conditions).

BAYSHORE DRAINAGE AREA

The Bayshore drainage area covers the majority of The Baylands and receives incoming stormwater from portions of Daly City, Brisbane and the San Francisco watershed east of Bayshore Boulevard. Upon reaching The Baylands, the stormwater flows through the Specific Plan area through a series of underground and open systems and discharges onto U.S. Highway 101 right-of-way east of The Baylands. Ultimately, the storm drainage and surface water enter San Francisco Bay through an existing culvert under U.S. Highway 101.

Bayshore Drainage Area Existing Conditions

Stormwater flows onto The Baylands from the east as it enters an 8-foot by 5-foot brick arch sewer[13] located under Bayshore Boulevard. The brick arch culvert is in disrepair and lacks adequate capacity. The brick arch sewer carries the flows south and east through the West Side of The Baylands and receives additional runoff from a 2,400-foot-long, six-foot-deep earthen drainage channel parallel with Industrial Way within the West Side of The Baylands. The brick arch sewer crosses under the JPB rail corridor right-of-way and discharges to a timber box culvert west of the JBP onto the East Side of The Baylands. The timber box culvert has limited capacity and is in disrepair.

East of the JPB crossing, the timber box culvert drainage outfalls to an open channel westerly of Tunnel Avenue and

13 Although this drainage structure is called a "brick arch sewer" here to be consistent with referenced Infrastructure Report and graphics, it only conveys storm drainage and is not a sanitary sewer facility.

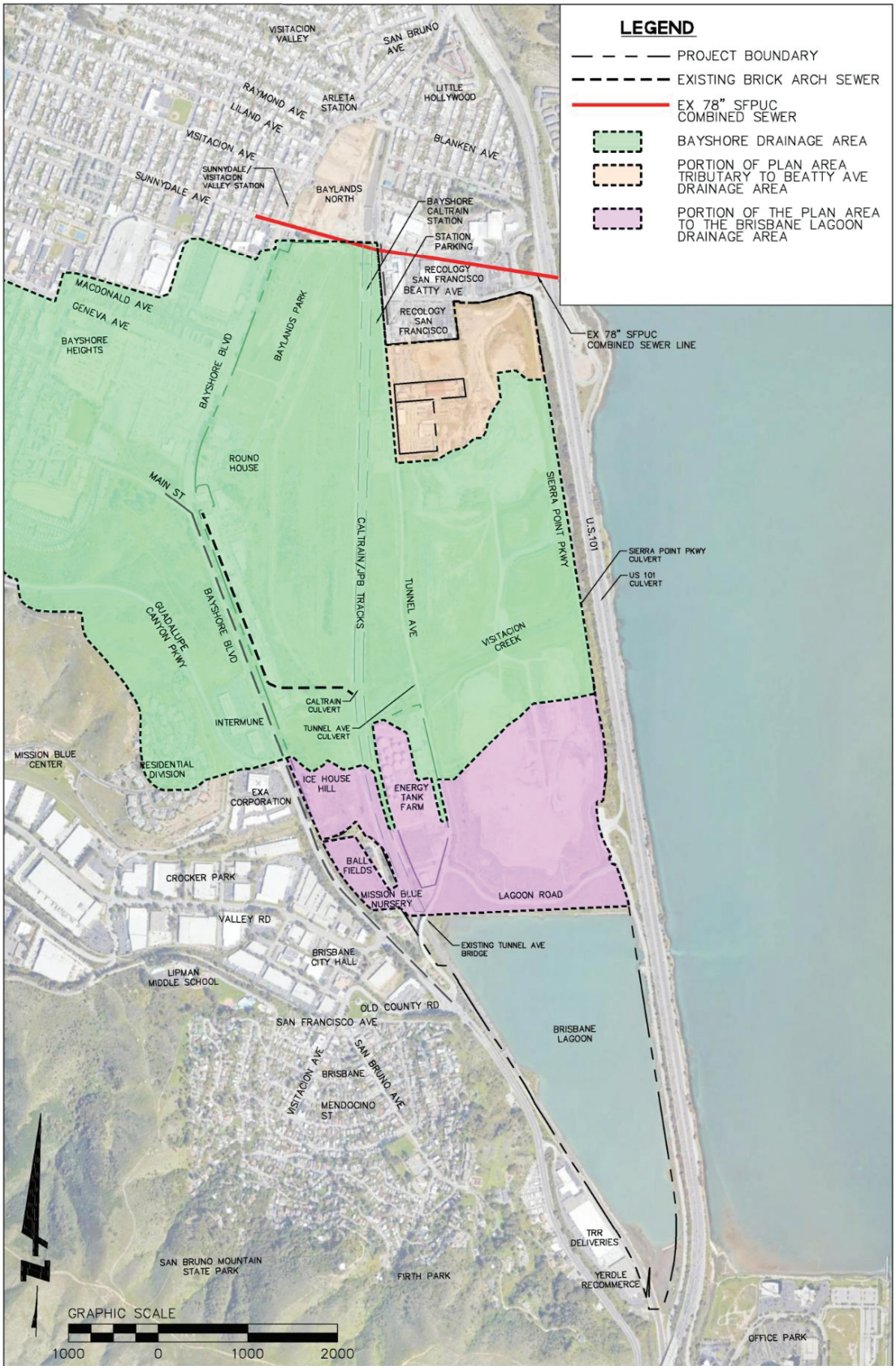

FIGURE 7.1 EXISTING STORM DRAINAGE CONDITIONS

then enters two 78-inch diameter culverts and crosses under Tunnel Avenue where it outfalls to the 2,400-foot-long, approximately 17-foot-deep earthen channel that contains Visitacion Creek. Visitacion Creek flows easterly to an existing 96-inch diameter culvert under Sierra Point Parkway where the drainage leaves The Baylands and flows through existing culverts under U.S. Highway 101 to San Francisco Bay.

Bayshore Drainage Area Proposed Improvements

On-site Storm Systems

Existing storm drain pipes, structures, and pumps in the East Side will be removed and/or replaced to allow for installation of the proposed landfill Low Hydraulic Conductivity Layer (LHCL) and other measures required to complete the landfill closure.

Existing pipes and structures on the West Side will be removed as needed to support re-grading and development of The Baylands and to support actions and requirements of the Remedial Action Plans for OU-SM and OU-2.

New stormwater infrastructure for new roads, developed pads and open space will be installed and runoff will be collected and conveyed through a network of inlets and storm drain pipes to connect to the main open channel/underground backbone line along Road A and to Visitacion Creek on the East Side. Grading and storm drainage designs supporting The Baylands result in the transfer of 19 acres of tributary area to the Bayshore drainage area from the Beatty Avenue drainage area.

Visitacion Creek Corridor

Within The Baylands, the brick arch sewer and timber box culvert will be replaced with an open channel and underground storm drainage system throughout the West Side and convey runoff through a new culvert crossing under the JPB corridor.

After crossing under the JPB corridor, storm drainage will outfall to a 45.2-acre-foot capacity surface stormwater detention area between the JPB corridor and Tunnel Avenue. The design of the culverts under the railroad tracks and the adjacent detention area will include backflow prevention solutions through natural or mechanical solutions to prevent tidal influence from reaching the West Side and detention area. In addition, the detention area was sized to both replace lost surface storage within the Railyard due to implementation of the Baylands and to reduce the depth and duration of ponding during large storm events at the Bayshore Boulevard Industrial Way intersection. Upon exiting the detention area by flowing through a new bridged or culvert crossing to be constructed as part of the the Baylands, under Tunnel Avenue, surface water will continue easterly through Visitacion Creek, under a clear span bridge at Sierra Point Parkway, and through the existing culvert underneath Highway 101 prior to discharge into the San Francisco Bay.

Maintenance of the Stormwater Detention Area is focused on preserving the integrity of the ecological focused planting through selective pruning and minimized root system disturbance, maintaining hydraulic capacity, and ensuring side slope stability through non-invasive activities.

Visitacion Creek east of the Tunnel Avenue undercrossing will be improved with an open channel design integrated with salt marsh and freshwater wetlands, as described in Chapter 05 Conservation and Open Space,[14] that, as a system, accommodates the overlapping of a 100-year design storm event with tidal flow, and with consideration of estimated SLR.[15] Created wetlands will be planted as part of a cohesive ecological and habitat improvement strategy, while providing slope stability. An impermeable liner is proposed below the channel bottom and side slopes to isolate landfill leachate from the Creek flows.

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14 Biohabitats, The Baylands Wetlands Mitigation Plan (February 2022)

15 To represent the current sea level conditions and consistent with the City's Master Plan, the tide elevation of 8.69 was used for hydraulic modeling. Adding the baseline to the anticipated State of California Sea-Level Rise Guidance, 2018 Update SLR estimates of approximately 24 inches by mid-century and 84 inches by the end of the century for the medium- high risk aversion scenario) by the end of the century. 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 potentially have to be raised to provide freeboard, thus the top of banks on either side of the Visitacion Creek are designed as adaptable. Incorporating adaptable bank design measures as part of the Visitacion Creek enables the top of bank elevations to be easily raised over time based on the freeboard requirements and Visitacion Creek water level conditions.

BEATTY AVENUE DRAINAGE AREA

Beatty Avenue Drainage Area Existing Conditions

At the northern portion of the East Side of The Baylands, approximately 46 acres drain into the Beatty Avenue storm drain basin infrastructure north of The Baylands. Stormwater runoff is captured by a series of inlets in the local streets and conveyed off-site to a succession of 30-inch and 42-inch reinforced concrete pipes. The San Francisco Public Utilities Commission (SFPUC) off-site system north of The Baylands traverses under U.S. Highway 101 and discharges to the Harney Way Box Culvert and into the Sunnydale pump station, located east of U.S. Highway 101 on Harney Way in San Francisco. This system currently experiences combined sewer overflows in the Harney Way box culvert.

Beatty Avenue Drainage Area Proposed Improvements

Roadway alignments and grading changes for The Baylands shift approximately 19 acres of Beatty Avenue basin away from the Beatty Avenue drainage area and into the Bayshore drainage area. This change reduces The Baylands' contribution to the Beatty Avenue watershed from 46 acres to approximately 27 acres, which helps alleviate existing downstream combined sewer overflows in the Harney Way box culvert. Existing storm drain infrastructure within the 19 acres being transferred to the Bayshore drainage area will be removed and reconstructed based on regrading of the area.

Within the remaining 27 acres of The Baylands that will continue to drain to the Beatty Avenue area, existing storm drain infrastructure will be retained unless removal or relocation is needed for new development. This infrastructure connects to the existing 42-inch diameter storm drainage infrastructure in Beatty Avenue.

BRISBANE LAGOON DRAINAGE AREA

Brisbane Lagoon Drainage Area Existing Conditions

In the southern upland area of the East Side of The Baylands, 52 acres drains into the Brisbane Lagoon. Flow from the existing ground surface is conveyed through a series of shallow swales adjacent to Lagoon Way and discharges through small culverts under Lagoon Way. Upon exiting the Lagoon Way culverts, the flows continue overland southerly to the Brisbane Lagoon.

Brisbane Lagoon Drainage Area Proposed Improvements

The existing culverts under Lagoon Way are proposed for removal as part of the Title 27-compliant Landfill Closure process. In support of proposed improvements, a minimum of two new outfalls to the Brisbane Lagoon will be installed to discharge runoff captured in the tributary catchment areas. Installation of the new Brisbane Lagoon outfalls will be coordinated with landfill closure activities and adjacent Kinder Morgan infrastructure.

7.4.3 SYSTEM-WIDE STORM DRAINAGE

DESIGN PARAMETERS

The on-site storm drain system is designed to contain the existing 25-year storm runoff event entirely within the underground piping or open channel system such that conveyed flows do not inundate The Baylands roadways and recreational facilities.

For a 100-year storm event, storm drainage will be contained within new streets. Key roadways — Lagoon Road, Tunnel Avenue, Geneva Avenue, and proposed Sierra Point Parkway — will remain usable as evacuation routes in a 100-year storm event.

Connections to existing streets that provide access to properties adjacent to The Baylands and are below current or projected flooding levels will remain subject to flooding. Grading and drainage improvements such as raising grades, installation of sump pumps, or installation of stormwater lift stations can be installed by others to address flooding in these areas.

STORM DRAIN MATERIALS

The on-site system includes use of fusion-welded high-density polyethylene (HDPE) pipes with flexible connections at structures and special manhole and inlet designs to minimize inflow and infiltration and provide flexibility to accommodate settlement.

To minimize excavations and storm drain installations that may disturb the underlying LHCL, storm drain infrastructure will include special manholes and lift stations to keep the system as shallow as possible (refer to Figure 7.2 for the conceptual storm drainage system improvements).

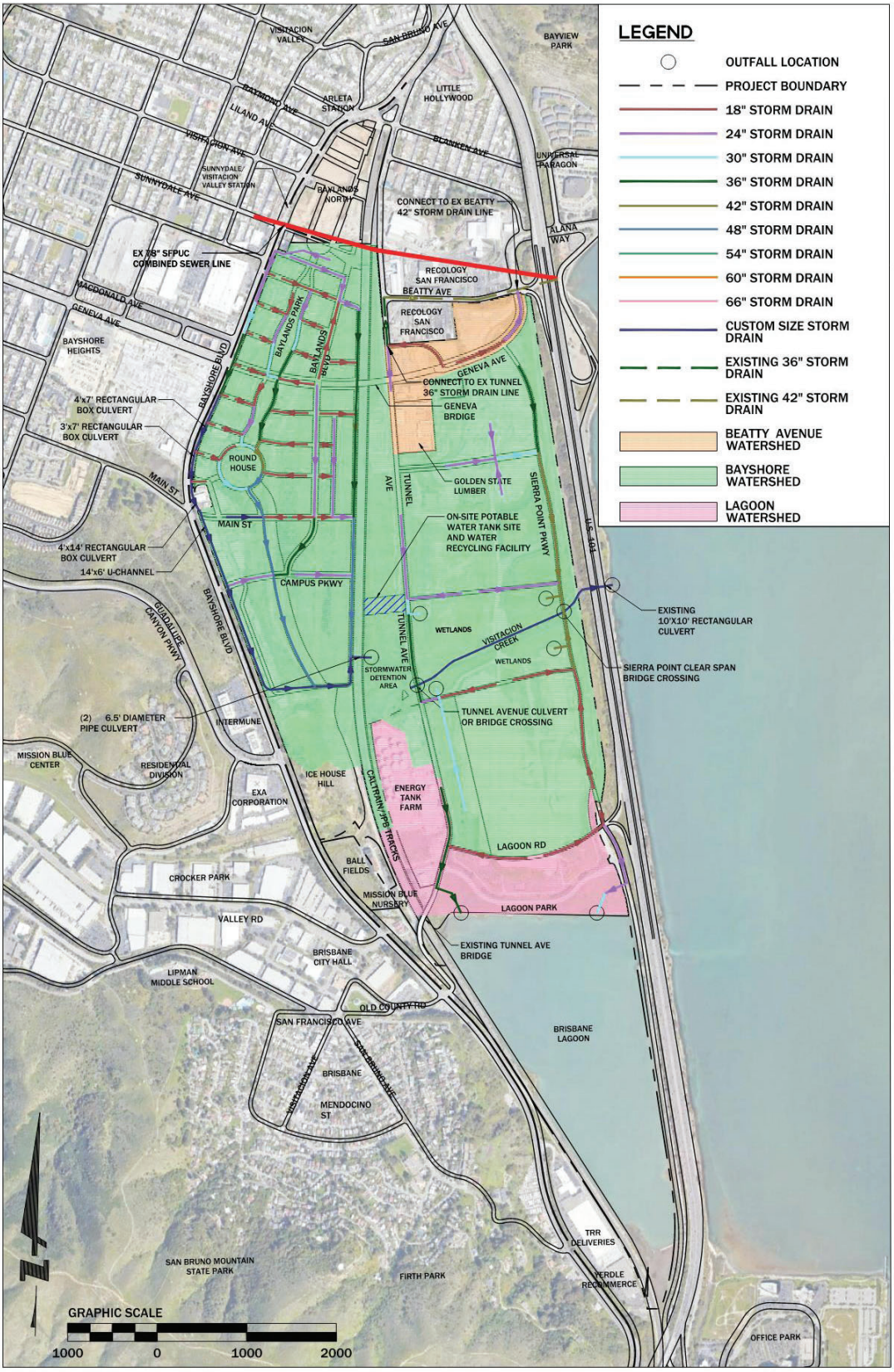

FIGURE 7.2 CONCEPTUAL STORM DRAINAGE SYSTEM IMPROVEMENTS

7.4.4 STORMWATER QUALITY AND SURFACE WATER PROTECTION

TREATMENT FOR STORMWATER QUALITY

Stormwater treatment for runoff from pollution-generating surfaces within The Baylands will be provided to meet the requirements of Provision C.3 of the NPDES Municipal Regional Stormwater Permit, as implemented by the SFRWQCB.

Stormwater runoff is treated prior to discharge to wetlands, Visitacion Creek, Brisbane Lagoon and the San Francisco Bay in compliance with Provision C.3. In addition, stormwater treatment includes pre-treatment of development runoff before flow is directed to created wetlands as part of the larger sustainable stormwater strategy.

Stormwater entering The Baylands from upstream Bayshore Avenue does not receive treatment within The Baylands except for incidental filtration or settlement associated with flows through open channels, the in-line stormwater detention area, and Visitacion Creek as the runoff traverses The Baylands.

Stormwater treatment in The Baylands includes LID strategies that promote landscape, habitat focused and infiltration solutions where permitted. To support physical stormwater management designs, The Baylands operations include source control measures, such as community outreach, stormwater management literature and stormwater inlet stenciling.

The final detailed selection, design and approval of stormwater treatment measures occurs with the City of Brisbane during the permitting process to inform the development of the Stormwater Management Plan (SMP).

LOW IMPACT DEVELOPMENT STRATEGIES

The Baylands will incorporate LID strategies in accordance with Provision C.3, as well as the San Mateo Countywide Water Pollution Prevention Program C.3 Stormwater Technical Guidebook (Guidebook). These practices are intended to protect surface waters by mimicking natural runoff processes.

Given the presence of clay soil in the West Side, and waste and clay in the East Side, opportunities to infiltrate may be limited. Where infiltration is limited due to site conditions and high groundwater levels are present, stormwater treatment measures will be underlain with perforated storm drain pipe on top of an impermeable liner to prevent both water infiltration into underlying soil and groundwater, and leachate creation. In addition, the Baylands Water Recycling Facility provides recycled water for irrigation, cooling and commercial building uses (toilet flushing, etc.), thus stormwater reuse may be, but is not presently, anticipated. To the extent feasible, clean treated stormwater may be released into created wetlands where appropriate to support function of these wetlands.

Proposed LID strategies emphasize the use of natural and landscape-based stormwater control measures as the preferred means of providing stormwater management. The stormwater run-off from The Baylands is managed by a combination of volume- and flow-based treatment concepts, which includes one or a combination of the following options:

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

CONSTRUCTION-PHASE SURFACE WATER PROTECTION

Construction activities that create potential for erosion and siltation of surface waters are subject to additional stormwater pollution prevention planning requirements as required per NPDES Construction General Permit and are applicable to grading and construction activities. Construction-phase SWPPPs are required to support related permits and construction activities, but are not part of permanent stormwater infrastructure for the site.

7.4.5 STORM DRAINAGE CRITERIA

The storm drainage system within The Baylands shall implement solutions to address the following:

- *Storm drainage collection facilities shall have capacity to convey the peak flow rate from a 25-year storm event entirely within the piping system such that Baylands roadways and recreational facilities are not flooded.*
- *The stormwater system shall accommodate the 100-year peak storm event within the piping system and within streets such that building finished floor elevations have a minimum of 1-foot of freeboard above the 100-year storm event hydraulic grade line water elevation with tidal flow and 2100 Medium-High Risk SLR.*
- *Stormwater conveyance and storage capacity shall be sufficient to keep key roadways, including Sierra Point Parkway, Lagoon Road and Tunnel Avenue, available as evacuation routes in the event of a 100-year storm event with tidal flows.*
- *Existing drainage inlets fronting Levinson Overflow Area and the PG&E substation shall be hydraulically isolated from the existing Brick Arch Sewer system.*
- *Underground stormwater installations shall be designed to minimize impacts to the underlying Low Hydraulic Conductivity Layer for landfill closure.*
- *Storm drain materials and design shall include materials and installation techniques that address anticipated settlement due to compression/ decomposition of the waste material.*

7.5 POTABLE WATER

The Baylands potable water system is designed to provide, store and distribute adequate potable water to all planned uses in The Baylands. The Specific Plan identifies a secure supply and presents a system of storage and distribution to meet consumption, fire flow and adequate water pressure throughout The Baylands. The Baylands Infrastructure Report provides a detailed description of the potable water system.[16]

16 BKF et al, The Baylands Infrastructure Report

Water conservation and re-use are key measures to support sustainable water in The Baylands. These are coordinated with in Chapter 04 Sustainability Framework of this Specific Plan and include the following:

- *Water budgeting and auditing*
- *Public education*
- *Efficient appliance rebates*
- *Multi-family unit sub metering*
- *Water-efficient landscaping*
- *Water-efficient bathroom and kitchen fixtures*
- *Dual plumbing non-residential buildings for recycled water*
- *Recycled water production from on-site sources*
- *Recycled water use for irrigation*

7.5.1 EXISTING POTABLE WATER SYSTEM

EXISTING SOURCE AND USE

The Baylands is located within water service areas of the City of Brisbane and Guadalupe Valley Municipal Improvement District (GVMID), operated by the City. The City currently purchases and receives its water from the SFPUC through the Hetch Hetchy Regional Water System. Potable water enters the City through five connections (turnouts) on SFPUC aqueducts that traverse the City of Brisbane.[17]

No groundwater resources, desalination or surface water supplies are currently available to the City of Brisbane.

Current water use from existing development within The Baylands is approximately 18.86 acre-feet per year (AFY).

EXISTING STORAGE AND DISTRIBUTION

The City's water system includes six pressure zones serviced by four booster pumping stations and four storage tanks. These tanks and associated distribution currently have about 2.9 million gallons (MG) of available storage. The City's 2003 Water Master Plan recommended increasing system-wide storage by 1.2 MG to improve fire and emergency storage but did not account for The Baylands. Since 2003, the City has added 0.2 MG of storage at its Glen Park site.[18]

17 BKF et al, The Baylands Infrastructure Report

18 Brown and Caldwell, Technical Memorandum Baylands Water

7.5.2 THE BAYLANDS POTABLE WATER DEMANDS[19]

While existing land uses on The Baylands are served by the City of Brisbane, the City does not currently have a water supply allocation or existing storage to serve full buildout of The Baylands.

DEMAND

Total water demand (potable and non-potable) at build-out of The Baylands is calculated to be 1,408 AFY.

To reduce demand for potable water, a portion of the Baylands total demand will be offset through use of recycled water generated from on-site wastewater treatment. The recycled water will be used primarily for irrigation, but will also be used in building cooling tower systems and non-residential flushing demands.

Use of recycled water is calculated to offset annual potable demand by 286 AFY.

After accounting for generation and use of recycled water, annual potable water demand for the Baylands at build-out is 1,122 AFY.

CONSTRUCTION-PHASE WATER NEEDS

During initial grading and construction activities for The Baylands, potable water will be accessed from the existing Brisbane potable water system. This water will be used primarily for soil compaction, dust control and concrete work. Annual construction needs are estimated to be 16.6 AFY per year and are sufficiently sourced from the 18.86 AFY currently supplied to existing uses within The Baylands as these uses will be removed upon completion of construction of The Baylands.

7.5.3 THE BAYLANDS SUPPLY[20]

On December 8, 2021, BDI entered into a Memorandum of Understanding (MOU) with the Contra Costa Water District (CCWD) to acquire water supply water and reserve storage capacity at CCWD's Los Vaqueros Reservoir and conveyance to the Baylands Specific Plan Area through the SFPUC system. The CCWD-BDI MOU provides for anticipated delivery of 2,500 AFY, plus or minus 20 percent depending on final determination of need by BDI. This supply exceeds the 1,122 AFY potable annual demand for The Baylands. The water is conveyed to the South Bay Aqueduct then to the SFPUC regional water system to Brisbane and The Baylands.

7.5.4 THE BAYLANDS WATER STORAGE

The City currently has no storage directly available to the Brisbane 1 and GVMID 1 pressure zones connected to the SFPUC aqueducts. To maintain proper water pressure within The Baylands for new development, a new water distribution system requires additional storage and properly sized interconnecting water mains and control valves within the City Brisbane service areas.

To meet future conditions, including The Baylands, additional storage of approximately 3.16 MG is needed, based on 1.5 times the average daily potable water demand (1.5 X 1.14=1.711 MG) plus a 6,000-gallons per minute (GPM) fire flow for four hours (1.44 MG).[21]

ON-SITE STORAGE TANK

As shown on Figure 7.3, the Baylands preferred water storage location is an on-site ground-level water storage tank tank with pumps and sized approximately 125-feet in diameter and 40-feet tall. To operate the on-site water tanks and associated infrastructure, the annual energy demand is estimated at 575,000 Kilowatt hours. Located on a separate parcel north of the stormwater detention area east of the railroad tracks, the proposed water storage tank is sited within the Infrastructure Development parcel, adjacent to the planned water recycling facility. This location includes an emergency standby generator to assure pumping continues during power outages. The location has sufficient size and elevation to accommodate several million gallons of storage to deliver adequate pressure to The Baylands. Operating expenses will be covered in a Mello Roos District or Home Owners Association (HOA)/Commercial Owners Association (COA).

Balance (March 2022 Update to Baylands Water Demand), (March 31, 2022)

19 Ibid

20 Ibid

21 Brown and Caldwell, City of Brisbane Water Master Plan (June 2003)

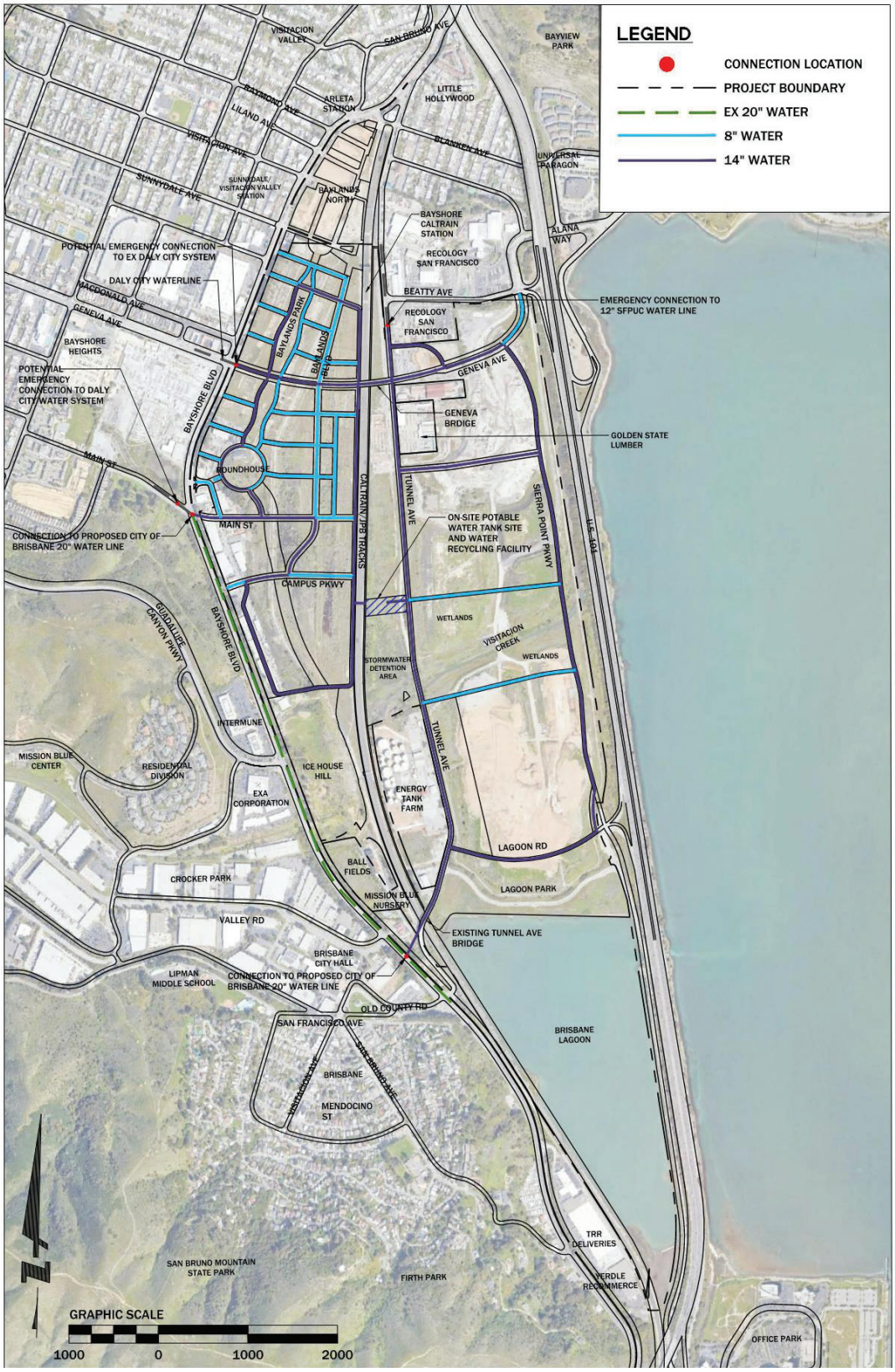

FIGURE 7.3 PROPOSED PORTABLE WATER SYSTEM IMPROVEMENTS

7.5.5 ON-SITE POTABLE WATER DISTRIBUTION SYSTEM

DELIVERY CRITERIA

The California Code of Regulations, Title 22 in the California Waterworks Standards, requires that water distribution systems have capacity to deliver domestic demand coincident with the required fire flow. Thus, the new domestic water system in The Baylands provides the maximum daily demand (1.5 times the average demand) of 1,200 GPM across The Baylands, coincident with 6,000 GPM fire flow at 20-pounds-per-square inch gauge (psig) residual pressure.

ON-SITE PIPE NETWORK

The on-site water system for The Baylands consists of a grid of 8-inch diameter pipes surrounded by 14-inch diameter loops.

Subject to State of California and City of Brisbane approvals, The Baylands water system is proposed to be constructed with HDPE pipe. HDPE is planned due to its flexibility and capacity to handle anticipated soil settlement within The Baylands, thereby reducing potential for pipe shearing. To accommodate hard edge differential settlement at the interface between a proposed pile-supported building and a HDPE potable or fire water lateral service connection, flexible connections with settlement vaults, as appropriate based on coordination with material specifications, are proposed to mitigate shearing of the utility infrastructure.

A waiver in compliance with Section 64572(f), Title 22, California Code of Regulations to construct water lines on top of the closed landfill is required to be processed for approval. Water system designs are proposed to include appropriate mitigations in support of the waiver approval (refer to Figure 7.3 for the proposed potable water system improvements).

7.5.6 POTABLE WATER CRITERIA

The potable water system within The Baylands shall implement solutions to address the following:

- *A reliable water supply, approved by the City of Brisbane to support proposed uses within The Baylands, shall be secured prior to site development.*
- *Water conservation measures and use of recycled water shall be enacted to reduce demand for potable water.*
- *Water storage shall be provided to assure delivery of potable water and fire flow demand, based on 1.5 times the average daily demand plus 6,000 gallons per minute fire flow for four hours.*
- *Flexible potable water distribution piping shall be used within The Baylands where post-construction ground settlement is anticipated within The Baylands.*
- *Mitigations required to support a waiver to construct water lines on top of the closed landfill area shall be included in design of the on-site water distribution system.*

7.6 RECYCLED WATER

The Baylands includes an on-site recycled water system to reduce demand for potable water and meet the sustainability goals as presented in Chapter 04 Sustainability Framework of this Specific Plan. The on-site system is supplied by a Water Recycling Facility (WRF). Recycled water generated by the WRF is distributed to uses by way of a separate piping system from the potable water network to prevent unintended use of recycled water and to avoid contamination of the potable water system. The Baylands Infrastructure Report provides a detailed description of the recycled water system.[22]

7.6.1 RECYCLED WATER DEMAND

To reduce reliance on potable water sources, recycled water in The Baylands will primarily be used to support irrigation of open space areas, rights-of-way, roadside planter areas and landscape water features.

In addition to irrigation, recycled water will also be provided to commercial, office and biotech uses to support industrial cooling, supply non-residential toilet and urinal flushing and other Title 22[23] permitted uses.

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22 BKF et al, The Baylands Infrastructure Report

23 California Code of Regulations Title 22, Article 2, "Uses of Recycled Water"

Maximum recycled water demand in The Baylands is estimated to be approximately 0.22 million gallons per day (MGD) for irrigation use during summer months, and 0.08 MGD for in-building uses year-round.[24]

7.6.2 RECYCLED WATER SUPPLY[25]

The Baylands includes development of a WRF, which is proposed to be owned and operated by the City of Brisbane. The WRF creates recycled water by scalping wastewater generated on-site with the ability to harvest from off-site sources where required or permitted, if sufficient on-site sewage is not sufficient to run the WRF.

For conceptual sizing of the WRF treatment capacity, the facility is sized for twice the peak daily use for irrigation (0.44 MGD) plus the average of in-building uses (0.08 MGD), for a total design capacity of 0.52 MGD.

With an average dry weather capacity of 0.52 MGD, the WRF provides treatment and disinfection of wastewater for safe, reliable recycled water through a multi-stage system consisting of mechanical and biological treatment steps. Storage tanks, pumps and emergency generators are additional components of the WRF design.

The WRF is sited in the area east of the JPB corridor adjacent to the on-site water storage tank and is anticipated to require approximately one acre. The process for final selection of the WRF design and phased implementation is based on siting, environmental and economic constraints, with detailed design resolution confirmed during future design and permitting processes

At the WRF, sanitary sewer flows in excess of the volumes needed to generate the recycled water supply for The Baylands are bypassed and routed through gravity and force mains in Tunnel Avenue to the SFPUC combined sewer infrastructure located parallel to the County line. The SFPUC combined sewer conveys wastewater to the SFPUC's Southeast Water Pollution Control Plant (SEPCP). In addition, the WRF includes infrastructure that pressurizes the on-site recycled supply distribution system, described below, to serve The Baylands.

7.6.3 RECYCLED WATER DISTRIBUTION

Recycled water distribution mains are installed in the public rights-of-way with a grid of 6-inch HDPE pipe surrounded by an 8 to 12-inch HDPE looped system. Fusion-welded HDPE is planned due to its flexibility and capacity to address anticipated settlement within The Baylands, thereby reducing the potential for pipe shearing. Where hard edge differential settlement is anticipated at the interface between a proposed building and a HDPE potable or fire water lateral service connection, flexible connections are planned to mitigate shearing of the utility infrastructure. Services to buildings and open space areas are metered and include code required backflow prevention.

Depending on demands, storage tanks or buildings' internal booster pumps act to maintain flows and pressures within the recycled water system, where required (refer to Figure 7.4 for the proposed recycled water system improvements)

7.6.4 RECYCLED WATER CRITERIA

The recycled water system within The Baylands shall implement solutions to address the following:

- *The WRF shall treat raw sewage to the extent needed to meet proposed on-site demands for "non-potable uses" as allowed under Title 22. If any excess effluent occurs daily, it will discharge through a force main that flows to SFPUC's collection system. If a higher demand occurs and construction is deemed feasible, the WRF design and capacity shall be scaled accordingly.*
- *The Wastewater processing tanks and structures shall be covered or fully enclosed in a building with air collected and treated through a two-stage odor scrubbing system, likely biological filtration followed by activated carbon polishing.*
- *All WRF facilities shall be designed to minimize visual impacts, e.g., installing berms to decrease ground-level visibility and structures shall receive exterior architectural treatment consistent with other Baylands development.*
- *Recycled water distribution pipelines, structures and connections shall use construction materials and techniques to address anticipated site settlement.*

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24 Brown and Caldwell, Technical Memorandum Baylands Water Balance

25 Brown and Caldwell, Technical Memorandum Baylands Water Recycling Facility (WRF) Conceptual Planning, (March 31, 2022)

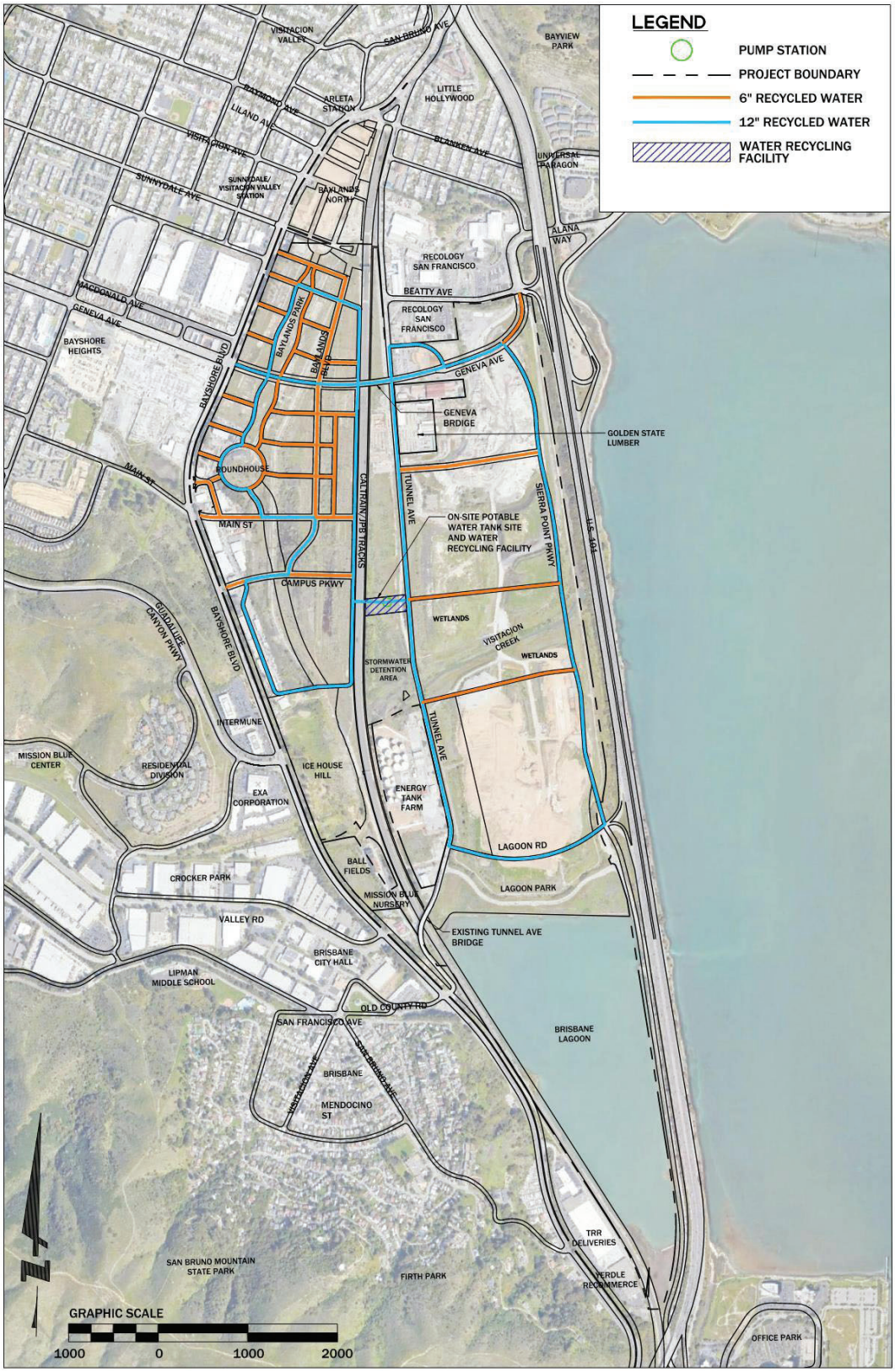

FIGURE 7.4 PROPOSED RECYCLED WATER SYSTEM IMPROVEMENTS

7.7 WASTEWATER

The Baylands includes a wastewater collection system designed to handle anticipated sanitary sewer demands for the development through a combination of gravity and force main sewer lines in combination with pump and lift stations. On-site sanitary sewage is generated and routed to the proposed WRF for extraction and treatment of non-potable water to reduce demands for potable water on-site. Sludge from the WRF and sewage that does not go through the WRF is routed to the SFPUC system at the north end of The Baylands. The Baylands Infrastructure Report provides a detailed description of the sanitary sewer system.[26]

7.7.1 WASTEWATER SYSTEM

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. Both the City of Brisbane and BSD systems discharge sewer flows to the SFPUC's 78-inch-diameter combined sewer line (SFCS) at the north end of The Baylands, which conveys the flows to the SEPCP.

EXISTING SEWER FACILITIES

Existing BSD sanitary sewer lines serving the Industrial Way buildings and connecting to other existing or demolished buildings on the West Side will be removed due to incompatibility with future street grid and remediation efforts. On the East Side, flow from the existing Tank Farm is pumped from a small lift station within the Tank Farm through a force main to the BSD sanitary sewer main on Tunnel Avenue.

Existing sanitary sewer flows from the West and East Sides are conveyed to the existing SFCS located adjacent to Sunnydale Avenue and underneath portions of the Recology Recycling Plant. Parallel to the SFCS, the SFPUC recently installed a parallel 169-inch combined sewer to increase storage capacity for wet weather storm events. The SFCS main then discharges to the SFPUC Box Culvert in Harney Way before conveying flow through a series of gravity and force mains, and pump and lift stations to the SEPCP.

EXISTING WASTEWATER SYSTEM CAPACITY

The SEPCP currently receives an average dry weather flow of 57 MGD, which accounts for approximately 70 percent of its available dry weather flow capacity of 85 MGD. In addition, the SFPUC upgraded the SEPCP 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 reduce the frequency of combined sewer overflows into the Bay further and increase system capacity, the City of San Francisco recently constructed a new combined sewer line in and adjacent to Sunnydale Avenue that connects to the box culvert in Harney Way.

Under the current contract, the City of Brisbane is allowed to convey sewer discharges to the SEP 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, BSD has no set capacity allocation at the SEP based on its current contract. Per conversations with BSD, the established protocol dictates that if the development of The Baylands requires service for a demand greater than 0.200 MGD, then the BSD notifies the staff at the SEPCP to confirm that capacity is available.

7.7.2 THE BAYLANDS WASTEWATER SYSTEM

WASTEWATER GENERATION

Sanitary sewer demands are based on a 95 percent return rate of the average daily potable water demand and a 100 percent return rate of the indoor non-potable water demand for The Baylands. Assuming implementation of some water conservation measures, The Baylands, at full buildout, generates an approximately 400 MG per year of sewer with an approximate average daily sewage generation of 1.09 MGD and a peak daily sewage generation of 5.46 MGD.[27]

WASTEWATER RELATIONSHIP WITH WATER RECYCLING FACILITY

26 BKF et al, The Baylands Infrastructure Report

27 BKF Engineers, Preliminary Sanitary Sewer Calculations (April 4, 2022)

The Baylands WRF creates a recycled water supply by scalping wastewater generated on-site with the ability to harvest from off-site sources where required or permitted if sufficient on-site sewage is not sufficient to run the WRF.

Sanitary sewer flows exceeding volumes needed to generate recycled water supply will be bypassed and routed through gravity and force mains in Tunnel Avenue to the SFPUC combined sewer infrastructure located parallel to the County line that conveys wastewater to the SEPCP. During periods of lower recycled water demands, an option to ratchet back the volume of flow treated by diverting "excess" raw sewage to the SFCS via the force main is included as part of the WRF design subject to final approvals. Solids from the WRF are then returned through the force main leaving the WRF for discharge to the SFCS and transported through the municipal sewer system to the SEPCP.

Although not anticipated as part of the WRF, effluent quality from the on-site WRF generally is suitable for discharge under a separate discharge permit, but direct discharge to the Bay is not currently proposed, as it is likely infeasible due to potential time delays associated with obtaining a discharge permit from the SFRWQCB.

Phased construction of an on-site WRF will provide wastewater treatment to meet proposed recycled water demand in The Baylands with operation of the WRF commencing once 0.22 MGD of average dry weather sewer flows are generated by the Baylands. If permits for the WRF cannot be obtained, construction of an on-site wastewater collection system that discharges to the SFCS line in Sunnydale Avenue for treatment at the SEPCP is proposed for evaluation and feasibility as sanitary sewer demands and modeling conservatively assumes that the WRF is non-operational to account for maintenance and operational repairs.

PROPOSED WASTEWATER COLLECTION SYSTEM

Due to planned street grid and expected settlement, sanitary sewer facilities are proposed to be re-built to match the new alignment of Tunnel Avenue.

Wastewater is collected and conveyed through a series of HDPE gravity and force mains and in-line lift and/or pump stations to limit utility excavation and installation depths over remediation areas and the landfill. Fusion-welded HDPE is being planned due to its flexibility and the anticipated settlement within The Baylands, thereby reducing the potential for pipe shearing.

Flows are delivered to the WRF on the East Side between the railroad track and Tunnel Avenue through a sewer main underneath the railroad tracks. On the East Side, flows from a leachate collection system installed as part of the landfill closure approvals, if required, are delivered to the on-site sanitary sewer system.

Proposed building services are connected to the on-site system and include cleanouts 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 pile-supported building and sewer building lateral connections.

Space within public streets is provided for a new BSD wastewater force main that connects its existing sanitary sewer pump station near the corner of Industrial Way and Bayshore Boulevard to the SFCS. However, construction of the force main by the BSD is anticipated at a later date.

To accommodate existing uses and build-out of The Baylands, replacement of existing on-site wastewater collection system and associated facilities occurs in phases. At full build-out, the wastewater collection system will meet the standards of the City of Brisbane and The Baylands design criteria to be developed as part of future utility planning, and be owned, operated, and maintained by the City of Brisbane (refer to Figure 7.5 for the proposed wastewater system improvements).

7.7.3 WASTEWATER CRITERIA

The wastewater system within The Baylands shall implement solutions to address the following:

- *Wastewater collection and transmission pipelines over remediation areas and the landfill closure area shall be designed with lift stations and force mains or other measures to minimize the depth of the system.*
- *Wastewater pipelines, structures and connections to buildings shall be designed to address anticipated*

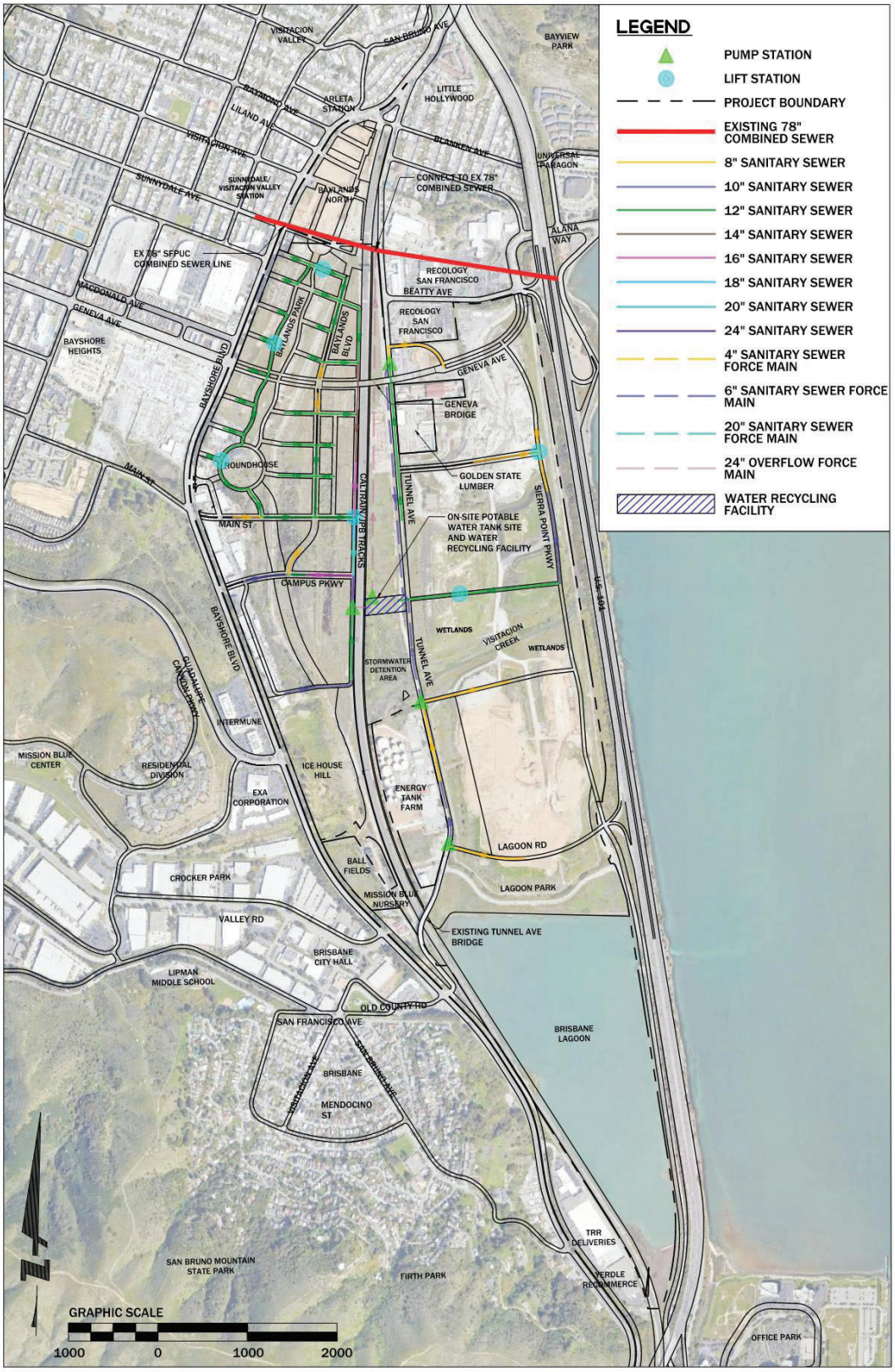

FIGURE 7.5 PROPOSED WASTE WATER SYSTEM IMPROVEMENTS

settlement due to remaining settlement from the waste material.

- *Wastewater generated within The Baylands shall be conveyed to the planned WRF for extraction and treatment of recycled water to match recycled water demand within The Baylands.*

7.8 ELECTRICAL

7.8.1 EXISTING ELECTRICAL SYSTEM

The existing distribution system for The Baylands area is a mix of underground cables and overhead lines managed under the control of Pacific Gas and Electric (PG&E). Existing lines such as those along Tunnel Avenue and Bayshore Blvd where it is necessary to connect to the PG&E grid will be located underground in accordance with PG&E's Rule 20b as part of future development in a manner that allows continued service to existing customers expected to remain in place.

7.8.2 ELECTRICAL POWER DURING CONSTRUCTION

Electrical power for construction is proposed to be provided by Pacific Gas and Electric Company (PG&E) and limit the use of hydrocarbon-based sources on-site but anticipate certain construction operations may require diesel or natural gas based power. Power sources such as solar or other market-available renewable strategies may be used subject to compliance with Brisbane's Use Permit requirements (Brisbane Municipal Code Chapter 17.41).

7.8.3 THE BAYLANDS ELECTRICAL SYSTEM

Electrical utilities in The Baylands will be provided to the site via underground electrical interconnection with PG&E New development under the Specific Plan would be served by PG&E via the Martin Substation in Daly City supplemented by an on-site substation. All proposed lines within the Baylands will be located underground within public right-of-way or in dedicated easements in a joint trench with other dry utilities as shown in Figure 7.6.

Significant ground area (Sustainable Infrastructure) and roof top area have been designated as eligible for solar generation. 85,000 MWh is the annual generation requirement from on-site sources with the remaining energy needed to meet energy neutrality (See Chapter 4 – Sustainability Framework) expected to come from off-site renewable sources. Even though the existing and/or upgraded PG&E or equivalent infrastructure will be utilized to provide electricity to the project, off-site clean electricity for future development shall be provided by Peninsula Clean Energy ("PCE") or another provider that sources electricity from 100 percent carbon-free sources.

The Baylands expects to deploy smart grid technology and distributed energy resources ("DERs") to the maximum extent possible to manage energy peaks and respond to fluctuations in electrical demand and supply. The Specific Plan area will also contain a centralized 250 MWs/1 GWh battery-based stationary energy storage intended to serve regional grid-customers. Battery based energy storage is an eligible use in Sustainable Infrastructure areas, as well as within structures in accordance with State and local Codes.

In addition to the DER deployment at individual buildings within the development, the 250MW/1GWh of centralized battery and Solar PV facilities will have a transmission level direct connection to PG&E infrastructure. The facilities may be deployed to serve the local Baylands loads and decarbonization goals, and the remainder available for grid services beyond the project boundary.

7.8.4 ELECTRICAL SYSTEM CRITERION

The electrical system for The Baylands shall adhere to the following.

- *Electrical transmission and distribution lines within The Baylands shall be installed underground.*

7.9 NATURAL GAS

7.9.1 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 Golden State 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 the Golden State lumber property within The Baylands area and other properties to the north. Based on proposed uses and roadway alignments, the Tunnel Avenue gas main is proposed to be relocated to follow the new roadway layout.

7.9.2 THE BAYLANDS NATURAL GAS USES

Consistent with Chapter 04 Sustainability Framework, the Baylands does not include PG&E natural gas infrastructure to serve proposed uses. Existing natural gas services to the Kinder Morgan Tank Farm property, the City of Brisbane facility of Tunnel Avenue and Golden State Lumber are proposed to be maintained .

7.10 COMMUNICATIONS

7.10.1 EXISTING COMMUNICATIONS SYSTEMS

An evaluation of the existing telecommunications facilities within and adjacent to the Baylands Specific Plan is being coordinated with the communications providers. Removal and replacement of the existing facilities is anticipated as part of the future development and based on demands associated with the phased buildout.

7.10.2 THE BAYLANDS COMMUNICATIONS SYSTEMS

No stand-alone telecommunication building facilities are anticipated; instead, telecommunication equipment that is standard for residential and commercial areas will be installed as ancillary equipment for buildings to assure adequate communication and broadband services for the new Baylands community. Specific telecommunication equipment lists and locations are premature, both because these continue to be evolving technologies and because these involve building design specification levels of details that are not part of the Specific Plan process. This ancillary telecommunication equipment informational details should not be required for evaluation in the EIR.

7.10.3 COMMUNICATIONS CRITERIA

Communications systems within The Baylands shall adhere to the following.

- *Communications infrastructure within The Baylands shall be evaluated and accommodated during final designs for the Specific Plan Area*

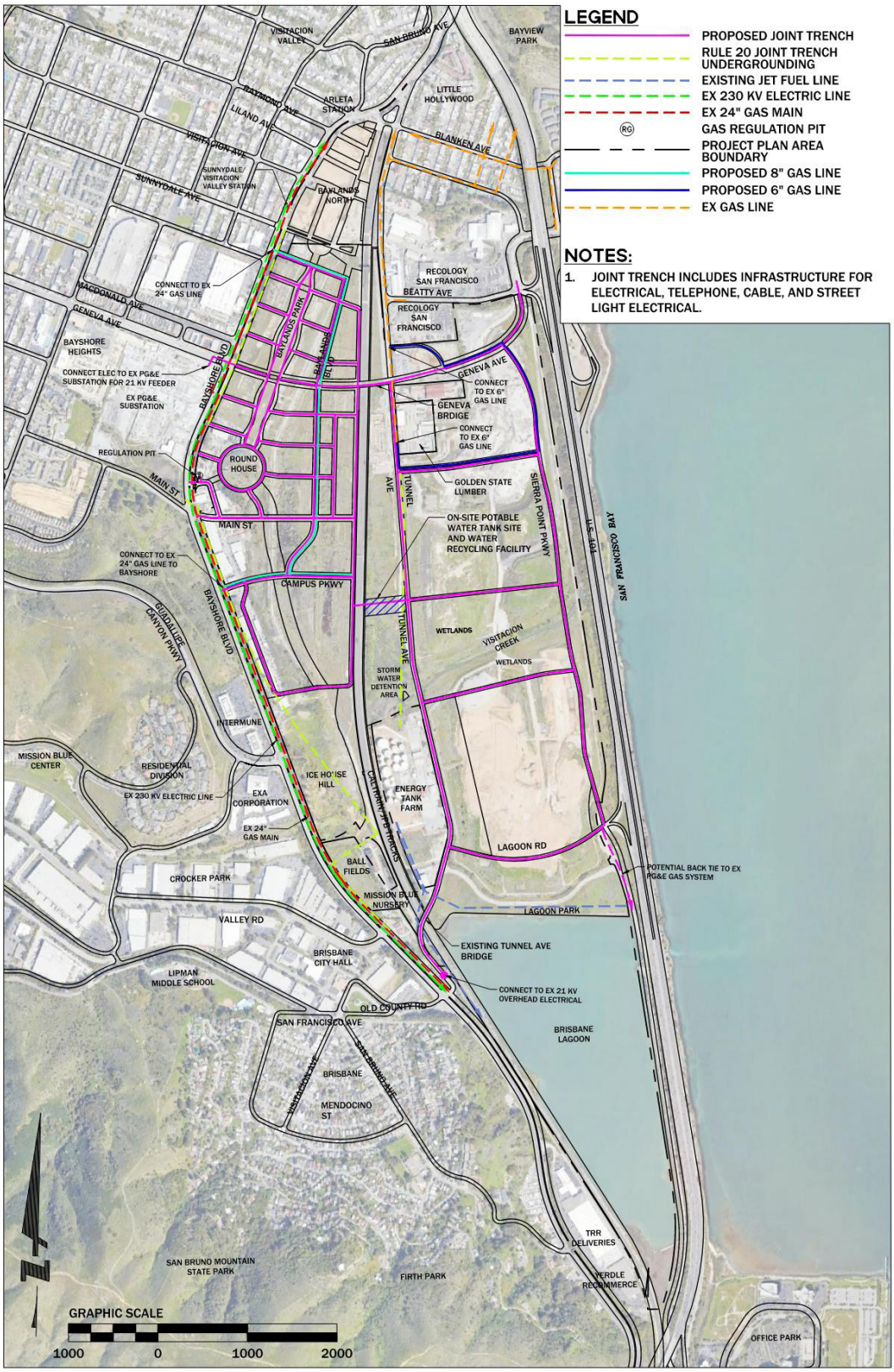

FIGURE 7.6 DRY UTILITIES AND KINDER MORGAN PIPELINES

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