OUR COMMITMENT TO SUSTAINABILITY

ESA helps a variety of public and private sector clients plan and prepare for climate change and emerging regulations that limit GHG emissions. ESA is a registered assessor with the California Climate Action Registry, a Climate Leader, and founding reporter for the Climate Registry. ESA is also a corporate member of the U.S. Green Building Council and the Business Council on Climate Change (BC3). Internally, ESA has adopted a Sustainability Vision and Policy Statement and a plan to reduce waste and energy within our operations. This document was produced using recycled paper.
# TABLE OF CONTENTS

Sunnyvale Water Pollution Control Plant Master Plan Draft EIR

## Page

### 5. Summary
- S.1 Summary Project Description S-1
- S.2 Summary of Impacts and Mitigation Measures S-6
- S.3 Summary of Alternatives S-6
- S.4 Areas of Controversy and Issues to be Resolved S-8

### 1. Introduction
- 1.1 Purpose of the Program Environmental Impact Report 1-1
  - 1.1.1 Purpose of the EIR 1-1
  - 1.1.2 Type of EIR 1-1
- 1.2 Overview of CEQA EIR Process 1-3
  - 1.2.1 Notice of Preparation and Scoping 1-3
  - 1.2.2 Draft PEIR 1-3
  - 1.2.3 Final PEIR 1-3
  - 1.2.4 Mitigation Monitoring and Reporting 1-4
- 1.3 Organization of the EIR 1-4

### 2. Project Background
- 2.1 Existing WPCP Operations 2-1
  - 2.1.1 Service Area 2-1
  - 2.1.2 WPCP Operations 2-2
- 2.2 WPCP Master Plan Process 2-7
- 2.3 Santa Clara Valley Water District Recycled Water Planning 2-8
  - 2.3.1 Expedited Recycled and Purified Water Program 2-8
- 2.4 Other Projects at the WPCP 2-10
- 2.5 References 2-10

### 3. Project Description
- 3.1 Location 3-1
- 3.2 Need for the Project 3-7
  - 3.2.1 Aging Infrastructure and Operational Reliability 3-7
  - 3.2.2 Regulatory Requirements 3-7
  - 3.2.3 Projected Increases in Flows and Loads 3-7
  - 3.2.4 Policy Decisions 3-7
- 3.3 Project Objectives 3-9
### 3. Project Description (continued)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4 Water Pollution Control Plant Improvements</td>
<td>3-10</td>
</tr>
<tr>
<td>3.4.1 Overview of WPCP Improvements and Schedule</td>
<td>3-10</td>
</tr>
<tr>
<td>3.4.2 Master Plan Phasing</td>
<td>3-10</td>
</tr>
<tr>
<td>3.4.3 Secondary Treatment</td>
<td>3-13</td>
</tr>
<tr>
<td>3.4.4 Tertiary Treatment and Water Recycling</td>
<td>3-18</td>
</tr>
<tr>
<td>3.4.5 Biosolids</td>
<td>3-24</td>
</tr>
<tr>
<td>3.4.6 Electrical and Combined Heat and Power</td>
<td>3-26</td>
</tr>
<tr>
<td>3.4.7 Support Facilities and Related Actions</td>
<td>3-27</td>
</tr>
<tr>
<td>3.4.8 Construction Characteristics</td>
<td>3-31</td>
</tr>
<tr>
<td>3.4.9 Operating Characteristics</td>
<td>3-33</td>
</tr>
<tr>
<td>3.5 Water Purification Facilities</td>
<td>3-34</td>
</tr>
<tr>
<td>3.5.1 Overview of Water Purification Facilities and Schedule</td>
<td>3-34</td>
</tr>
<tr>
<td>3.5.2 Location of Water Purification Facilities</td>
<td>3-36</td>
</tr>
<tr>
<td>3.5.3 Need for the Water Purification Facilities</td>
<td>3-36</td>
</tr>
<tr>
<td>3.5.4 Objectives of the Water Purification Facilities</td>
<td>3-38</td>
</tr>
<tr>
<td>3.5.5 Water Purification Processes at the WPCP</td>
<td>3-38</td>
</tr>
<tr>
<td>3.5.6 RO Concentrate Management Planning</td>
<td>3-45</td>
</tr>
<tr>
<td>3.5.7 Groundwater Replenishment Facilities</td>
<td>3-47</td>
</tr>
<tr>
<td>3.5.8 Construction Characteristics of the WPF</td>
<td>3-48</td>
</tr>
<tr>
<td>3.5.9 Operating Characteristics of the WPF</td>
<td>3-49</td>
</tr>
<tr>
<td>3.6 Uses of the PEIR</td>
<td>3-50</td>
</tr>
<tr>
<td>3.6.1 Required Actions and Approvals</td>
<td>3-50</td>
</tr>
<tr>
<td>3.6.2 Use of EIR in Approving Future Projects</td>
<td>3-50</td>
</tr>
<tr>
<td>3.7 References</td>
<td>3-52</td>
</tr>
</tbody>
</table>

### 4. Environmental Setting, Impacts and Mitigation

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Introduction</td>
<td>4.1-1</td>
</tr>
<tr>
<td>4.2 Land Use and Recreation</td>
<td>4.2-1</td>
</tr>
<tr>
<td>4.3 Transportation</td>
<td>4.3-1</td>
</tr>
<tr>
<td>4.4 Noise and Vibration</td>
<td>4.4-1</td>
</tr>
<tr>
<td>4.5 Air Quality</td>
<td>4.5-1</td>
</tr>
<tr>
<td>4.6 Greenhouse Gas Emissions</td>
<td>4.6-1</td>
</tr>
<tr>
<td>4.7 Biological Resources</td>
<td>4.7-1</td>
</tr>
<tr>
<td>4.8 Geology, Soils, Seismicity, and Mineral Resources</td>
<td>4.8-1</td>
</tr>
<tr>
<td>4.9 Hydrology</td>
<td>4.9-1</td>
</tr>
<tr>
<td>4.10 Water Quality</td>
<td>4.10-1</td>
</tr>
<tr>
<td>4.11 Hazards and Hazardous Materials</td>
<td>4.11-1</td>
</tr>
<tr>
<td>4.12 Public Services and Facilities</td>
<td>4.12-1</td>
</tr>
<tr>
<td>4.13 Utilities and Service Systems</td>
<td>4.13-1</td>
</tr>
<tr>
<td>4.14 Cultural Resources</td>
<td>4.14-1</td>
</tr>
<tr>
<td>4.15 Aesthetics</td>
<td>4.15-1</td>
</tr>
<tr>
<td>4.16 Energy Conservation</td>
<td>4.16-1</td>
</tr>
</tbody>
</table>

### 5. Growth Inducement Potential and Secondary Effects of Growth

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Introduction</td>
<td>5-1</td>
</tr>
<tr>
<td>5.2 Growth Inducement Potential</td>
<td>5-4</td>
</tr>
<tr>
<td>5.3 Growth Inducement Potential Conclusions</td>
<td>5-18</td>
</tr>
<tr>
<td>5.4 Impacts and Mitigation Measures: Secondary Effects of Growth</td>
<td>5-20</td>
</tr>
<tr>
<td>5.5 References</td>
<td>5-29</td>
</tr>
</tbody>
</table>
## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Cumulative Impacts and Other CEQA Issues</td>
<td></td>
</tr>
<tr>
<td>6.1 Approach to Cumulative Impact Analysis</td>
<td>6-1</td>
</tr>
<tr>
<td>6.2 Cumulative Impact Analysis</td>
<td>6-1</td>
</tr>
<tr>
<td>6.3 Significant Environmental Effects that Cannot be Avoided if the</td>
<td></td>
</tr>
<tr>
<td>Proposed Project is Implemented</td>
<td>6-9</td>
</tr>
<tr>
<td>6.4 Significant Irreversible Environmental Changes</td>
<td>6-34</td>
</tr>
<tr>
<td>6.5 References</td>
<td>6-35</td>
</tr>
<tr>
<td>7. Alternatives</td>
<td></td>
</tr>
<tr>
<td>7.1 Introduction</td>
<td>7-1</td>
</tr>
<tr>
<td>7.2 Approach to Alternatives Selection</td>
<td>7-2</td>
</tr>
<tr>
<td>7.3 Selected CEQA Alternatives</td>
<td>7-6</td>
</tr>
<tr>
<td>7.4 Comparison of Alternatives</td>
<td>7-18</td>
</tr>
<tr>
<td>7.5 Alternatives Considered but Eliminated From Further Analysis</td>
<td>7-20</td>
</tr>
<tr>
<td>7.6 References</td>
<td>7-23</td>
</tr>
<tr>
<td>8. Report Preparers</td>
<td></td>
</tr>
<tr>
<td>8.1 Project Sponsor/ Lead Agency</td>
<td>8-1</td>
</tr>
<tr>
<td>8.2 EIR Authors and Consultants</td>
<td>8-2</td>
</tr>
<tr>
<td>9. Acronyms and Abbreviations</td>
<td>9-1</td>
</tr>
</tbody>
</table>

### Appendices (Provided on CD)

| A. Notice of Preparation and Scoping Comments                             | A-1  |
| B. Air Quality Calculations                                              | B-1  |
| C. Greenhouse Gas Emissions Calculations                                 | C-1  |
| D. Biological Resources                                                  | D-1  |
| E. Secondary Effects of Growth                                           | E-1  |

### List of Figures

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>Site Location Map</td>
<td>S-3</td>
</tr>
<tr>
<td>S-2</td>
<td>Sunnyvale Water Pollution Control Plant Area Map</td>
<td>S-4</td>
</tr>
<tr>
<td>2-1</td>
<td>WPCP Water Treatment Process</td>
<td>2-2</td>
</tr>
<tr>
<td>2-2</td>
<td>Existing WPCP Process Areas</td>
<td>2-3</td>
</tr>
<tr>
<td>3-1</td>
<td>Site Location Map</td>
<td>3-3</td>
</tr>
<tr>
<td>3-2</td>
<td>Sunnyvale Water Pollution Control Plant Area Map</td>
<td>3-4</td>
</tr>
<tr>
<td>3-3</td>
<td>Master Plan Area</td>
<td>3-5</td>
</tr>
<tr>
<td>3-4</td>
<td>Master Plan Implementation Schedule</td>
<td>3-10</td>
</tr>
<tr>
<td>3-5</td>
<td>Proposed Master Plan Layout</td>
<td>3-11</td>
</tr>
<tr>
<td>3-6</td>
<td>Proposed Secondary Treatment and Biosolids Processes</td>
<td>3-14</td>
</tr>
<tr>
<td>3-7</td>
<td>Rehabilitation of Exisiting Facilities</td>
<td>3-15</td>
</tr>
<tr>
<td>3-8</td>
<td>Proposed Uses for Oxidation Ponds</td>
<td>3-19</td>
</tr>
<tr>
<td>3-9</td>
<td>Proposed Tertiary Treatment Processes</td>
<td>3-21</td>
</tr>
<tr>
<td>3-10</td>
<td>Other Facility Improvements</td>
<td>3-28</td>
</tr>
</tbody>
</table>
List of Figures (continued)

3-11 Water Purification Facilities Implementation Schedule 3-35
3-12 Potential District Groundwater Replenishment Facilities 3-37
3-13 Proposed WPCP Layout with Water Purification Facilities 3-39
3-14 Water Purification Facility Processes 3-42
4.2-1 Land Uses and Recreational Resources in the WPCP Vicinity 4.2-2
4.2-2 Cities Near the WPCP and Water Purification Facilities 4.2-6
4.2-3 Expected BCDC Jurisdiction 4.2-13
4.4-1 Decibel Scale and Common Noise Sources 4.4-3
4.4-2 Point Source Spreading with Distance 4.4-5
4.7-1 Biotic Habitats in the Master Plan Area 4.7-5
4.7-2 Historical Sloughs in the Master Plan Area 4.7-13
4.7-3 BCDC Jurisdiction in the Master Plan Area 4.7-14
4.7-4 CNDDB Plants Occurrences 4.7-17
4.7-5 CNDDB Wildlife Occurrences 4.7-21
4.7-6 CNDDB Plant Occurrences in the Vicinity of Water Purification Facilities 4.7-51
4.7-7 CNDDB Wildlife Occurrences in the Vicinity of Water Purification Facilities 4.7-52
4.8-1 Groundwater Elevations and Land Subsidence in Santa Clara County 4.8-5
4.8-2 Faults in the Project Vicinity 4.8-13
4.8-3 Seismic Hazards in the Project Vicinity 4.8-17
4.9-1 Creeks in the Master Plan and WPF Vicinity 4.9-5
4.9-2 FEMA Special Flood Hazard Areas 4.9-8
4.10-1 Net TDS Loading and Projected Average TDS Concentrations in the 4.10-8
Santa Clara Plain
4.10-2 Net Nitrate as NO3 Loading and Projected Average NO3 Concentrations 4.10-8
in the Santa Clara Plain
4.11-1 Hazardous Materials Sites within One Half-Mile of WPF Injection Well Area 4.11-8
4.11-2 Hazardous Materials Sites and Schools within One Half-Mile of Recharge Basins 4.11-9
4.15-1 Viewpoint Map 4.15-2
4.15-2 Photos 1 and 2 4.15-5
4.15-3 Photos 3 and 4 4.15-7
4.15-4 Photos 5 and 6 4.15-8
4.15-5 Photos 7 and 8 4.15-9
4.15-6 Photos 9 and 10 4.15-10
4.15-7 Photos 11 and 12 4.15-11
4.15-8 Photos 13 and 14 4.15-12
6-1 Cumulative Projects 6-7
7-1 Alternative 2: Realigned Access Road Alternative 7-10
7-2 Alternative 3: Diurnal Equalization and Emergency Storage in Pond 2 7-12
7-3 Alternative 4: Diurnal Equalization/Emergency Storage in SCVWD Pond A4 7-15
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>Summary of Action Alternatives</td>
<td>S-7</td>
</tr>
<tr>
<td>S-2</td>
<td>Summary of Impacts and Mitigation Measures for the Sunnyvale Water Pollution Control Plant Master Plan</td>
<td>S-9</td>
</tr>
<tr>
<td>S-3</td>
<td>Summary of Impacts and Mitigation Measures for Water Purification Facilities</td>
<td>S-39</td>
</tr>
<tr>
<td>3-1</td>
<td>Summary of Potential Regulatory Issues</td>
<td>3-8</td>
</tr>
<tr>
<td>3-2</td>
<td>2015 and 2035 Projected Wastewater Flows for the WPCP</td>
<td>3-8</td>
</tr>
<tr>
<td>3-3</td>
<td>Construction Equipment</td>
<td>3-31</td>
</tr>
<tr>
<td>3-4</td>
<td>Potential Review and Approval Actions by Other Agencies Following Completion of Project-Level CEQA</td>
<td>3-51</td>
</tr>
<tr>
<td>4.1-1</td>
<td>Letter Codes for Environmental Issues</td>
<td>4.1-2</td>
</tr>
<tr>
<td>4.2-1</td>
<td>WPF General Plan Designation and Zoning</td>
<td>4.2-17</td>
</tr>
<tr>
<td>4.2-2</td>
<td>Summary of Impacts - Land Use and Recreation</td>
<td>4.2-20</td>
</tr>
<tr>
<td>4.3-1</td>
<td>Signalized Intersection Level of Service Definitions Using Average Control Vehicular Delay</td>
<td>4.3-6</td>
</tr>
<tr>
<td>4.3-2</td>
<td>Level of Service Criteria for Freeway Segments</td>
<td>4.3-6</td>
</tr>
<tr>
<td>4.3-3</td>
<td>Summary of Impacts – Transportation</td>
<td>4.3-13</td>
</tr>
<tr>
<td>4.4-1</td>
<td>Approximate Relationship Between Increase in Environmental Noise Level and Human Perception</td>
<td>4.4-4</td>
</tr>
<tr>
<td>4.4-2</td>
<td>Approximate Reaction of People and Damage to Buildings from Construction Vibration Levels</td>
<td>4.4-6</td>
</tr>
<tr>
<td>4.4-3</td>
<td>Sound-Level Measurements in the Study Area</td>
<td>4.4-8</td>
</tr>
<tr>
<td>4.4-4</td>
<td>OSHA-Permissible Noise Exposure Standards for Workers</td>
<td>4.4-9</td>
</tr>
<tr>
<td>4.4-5</td>
<td>Significant Noise Impact from New Development on Existing Land Use</td>
<td>4.4-11</td>
</tr>
<tr>
<td>4.4-6</td>
<td>Summary of Impacts – Noise and Vibration</td>
<td>4.4-16</td>
</tr>
<tr>
<td>4.4-7</td>
<td>Typical Noise Levels from Demolition/Construction Equipment Operations</td>
<td>4.4-17</td>
</tr>
<tr>
<td>4.4-8</td>
<td>Vibration Source Levels for Construction Equipment</td>
<td>4.4-20</td>
</tr>
<tr>
<td>4.5-1</td>
<td>Air Quality Data Summary (2012-2014) for the Master Plan and WPF Areas</td>
<td>4.5-5</td>
</tr>
<tr>
<td>4.5-2</td>
<td>Ambient Air Quality Standards and San Francisco Air Basin Attainment Status</td>
<td>4.5-8</td>
</tr>
<tr>
<td>4.5-3</td>
<td>Summary of Impacts - Air Quality</td>
<td>4.5-15</td>
</tr>
<tr>
<td>4.5-4</td>
<td>Master Plan Average Daily Construction Exhaust Emissions</td>
<td>4.5-17</td>
</tr>
<tr>
<td>4.5-5</td>
<td>Combined Average Daily Construction Exhaust Emissions from Overlapping Master Plan Construction Stages</td>
<td>4.5-18</td>
</tr>
<tr>
<td>4.5-6</td>
<td>Annual Operational Emissions from Master Plan Improvements</td>
<td>4.5-21</td>
</tr>
<tr>
<td>4.5-7</td>
<td>WPF Average Daily Construction Exhaust Emissions</td>
<td>4.5-27</td>
</tr>
<tr>
<td>4.5-8</td>
<td>Combined Average Daily Construction Exhaust Emissions from Overlapping WPF Construction Stages</td>
<td>4.5-27</td>
</tr>
<tr>
<td>4.5-9</td>
<td>Annual Operational Emissions at the WPCP from WPF</td>
<td>4.5-31</td>
</tr>
<tr>
<td>4.6-1</td>
<td>California Greenhouse Gas Emissions</td>
<td>4.6-3</td>
</tr>
<tr>
<td>4.6-2</td>
<td>Emission Sources of CH₄ and NOₓ from Wastewater Treatment</td>
<td>4.6-5</td>
</tr>
<tr>
<td>4.6-3</td>
<td>Water Sector Recommended Actions of Climate Change Scoping Plan</td>
<td>4.6-8</td>
</tr>
<tr>
<td>4.6-4</td>
<td>Summary of Impacts – Greenhouse Gas Emissions</td>
<td>4.6-16</td>
</tr>
<tr>
<td>4.6-5</td>
<td>Estimated Total GHG Emissions from Master Plan-related Construction Activities</td>
<td>4.6-18</td>
</tr>
<tr>
<td>4.6-6</td>
<td>Total Estimated GHG Emissions from Master Plan Operations (2035)</td>
<td>4.6-19</td>
</tr>
</tbody>
</table>
List of Tables (continued)

<table>
<thead>
<tr>
<th>Table Number</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6-7</td>
<td>Total Estimated GHG Emissions for the Master Plan: Operations (2035) and Amortized Construction</td>
<td>4.6-19</td>
</tr>
<tr>
<td>4.6-8</td>
<td>Total GHG Emissions from WPF-related Construction Activities</td>
<td>4.6-21</td>
</tr>
<tr>
<td>4.6-9</td>
<td>Total Estimated GHG Emissions from WPF Operations (2035)</td>
<td>4.6-22</td>
</tr>
<tr>
<td>4.6-10</td>
<td>Total Estimated Operations and Amortized Construction GHG Emissions for the WPF (2035)</td>
<td>4.6-23</td>
</tr>
<tr>
<td>4.7-1</td>
<td>Habitat Acreages</td>
<td>4.7-3</td>
</tr>
<tr>
<td>4.7-2</td>
<td>Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Master Plan and Water Purification Facilities Areas</td>
<td>4.7-24</td>
</tr>
<tr>
<td>4.7-3</td>
<td>Ordinance-Sized Trees in the Master Plan Area</td>
<td>4.7-6</td>
</tr>
<tr>
<td>4.7-4</td>
<td>Summary of Impacts – Biological Resources</td>
<td>4.7-71</td>
</tr>
<tr>
<td>4.7-5</td>
<td>Species-Habitat Association</td>
<td>4.7-74</td>
</tr>
<tr>
<td>4.7-6</td>
<td>Master Plan Habitat Affected</td>
<td>4.7-74</td>
</tr>
<tr>
<td>4.8-1</td>
<td>Soil Types and Properties at the WPCP and the WPF Injection Well Area</td>
<td>4.8-6</td>
</tr>
<tr>
<td>4.8-2</td>
<td>Modified Mercalli Intensity Scale</td>
<td>4.8-11</td>
</tr>
<tr>
<td>4.8-3</td>
<td>Faults Within 20 Miles of the WPCP Site</td>
<td>4.8-14</td>
</tr>
<tr>
<td>4.8-4</td>
<td>Summary of Impacts – Geology, Soils, Seismicity, and Minerals</td>
<td>4.8-23</td>
</tr>
<tr>
<td>4.9-1</td>
<td>Tidal Water Levels for Coyote Creek at its Confluence with Alviso Slough</td>
<td>4.9-2</td>
</tr>
<tr>
<td>4.9-2</td>
<td>List of 303(d) Water Quality Impairments for Creek Segments in the Vicinity of the WPCP and WFP Sites</td>
<td>4.9-17</td>
</tr>
<tr>
<td>4.9-3</td>
<td>Relevant City of Sunnyvale General Plan Goals, Policies, and Statements Pertaining to Hydrology</td>
<td>4.9-25</td>
</tr>
<tr>
<td>4.9-4</td>
<td>Summary of Impacts – Hydrology</td>
<td>4.9-27</td>
</tr>
<tr>
<td>4.10-1</td>
<td>Summary of Groundwater TDS and Nitrate Concentrations in Santa Clara Plain – Overall</td>
<td>4.10-7</td>
</tr>
<tr>
<td>4.10-2</td>
<td>303(d) List of Impaired water bodies in the WPCP Vicinity</td>
<td>4.10-10</td>
</tr>
<tr>
<td>4.10-3</td>
<td>Federal Regulation of Disinfection Byproducts</td>
<td>4.10-11</td>
</tr>
<tr>
<td>4.10-4</td>
<td>Summary of Title 22 Standards and Uses of Recycled Water</td>
<td>4.10-17</td>
</tr>
<tr>
<td>4.10-5</td>
<td>Summary of Requirements for Groundwater Replenishment Projects Using Recycled Water</td>
<td>4.10-22</td>
</tr>
<tr>
<td>4.10-6</td>
<td>Beneficial Uses of Southern San Francisco Bay and Applicable Tributaries</td>
<td>4.10-24</td>
</tr>
<tr>
<td>4.10-7</td>
<td>Summary of Numeric Effluent Limitations for the WPCP</td>
<td>4.10-27</td>
</tr>
<tr>
<td>4.10-8</td>
<td>Relevant City of Sunnyvale General Plan Goals, Polices, and Statements Pertaining to Water Quality</td>
<td>4.10-30</td>
</tr>
<tr>
<td>4.10-9</td>
<td>Summary of Impacts – Water Quality</td>
<td>4.10-33</td>
</tr>
<tr>
<td>4.11-1</td>
<td>WPCP Chemical Usage in 2010</td>
<td>4.11-2</td>
</tr>
<tr>
<td>4.11-2</td>
<td>Existing Building and Structure Construction Dates</td>
<td>4.11-3</td>
</tr>
<tr>
<td>4.11-3</td>
<td>Hazardous Materials Sites within ¼-mile of Master Plan Project Components</td>
<td>4.11-6</td>
</tr>
<tr>
<td>4.11-4</td>
<td>Summary of Impacts – Hazards and Hazardous Materials</td>
<td>4.11-26</td>
</tr>
<tr>
<td>4.11-5</td>
<td>Proposed (2035) WPCP Chemical Usage</td>
<td>4.11-27</td>
</tr>
<tr>
<td>4.12-1</td>
<td>Summary of Impacts – Public Services and Facilities</td>
<td>4.12-6</td>
</tr>
<tr>
<td>4.13-1</td>
<td>Summary of Santa Clara County Landfills</td>
<td>4.13-2</td>
</tr>
<tr>
<td>4.13-2</td>
<td>Summary of Impacts – Utilities and Service Systems</td>
<td>4.13-7</td>
</tr>
<tr>
<td>4.14-1</td>
<td>Summary of Impacts – Cultural Resources</td>
<td>4.14-16</td>
</tr>
<tr>
<td>4.15-1</td>
<td>Summary of Impacts – Aesthetics</td>
<td>4.15-19</td>
</tr>
</tbody>
</table>
### List of Tables (continued)

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.16-1</td>
<td>PG&amp;E’s 2011 Electric Power Mix Delivered to Retail Customers</td>
<td>4.16-2</td>
</tr>
<tr>
<td>4.16-2</td>
<td>Summary of Impacts – Energy Conservation</td>
<td>4.16-9</td>
</tr>
<tr>
<td>5-1</td>
<td>Demographic Assumptions Used to Project Future Flows and Loads</td>
<td>5-6</td>
</tr>
<tr>
<td>5-2</td>
<td>Population Growth Trends Within Santa Clara County</td>
<td>5-7</td>
</tr>
<tr>
<td>5-3</td>
<td>ABAG Population, Housing, and Employment Projections: Santa Clara County</td>
<td>5-8</td>
</tr>
<tr>
<td>5-4</td>
<td>Growth Assumptions Used for Flows and Loads Projections Compared with 2011 Consolidated General Plan</td>
<td>5-12</td>
</tr>
<tr>
<td>5-5</td>
<td>Growth Assumptions Used for Flows and Loads Projections Compared with 2015 Draft LUTE</td>
<td>5-12</td>
</tr>
<tr>
<td>5-6</td>
<td>District UWMP Projected Average-Year Supplies</td>
<td>5-13</td>
</tr>
<tr>
<td>5-7</td>
<td>District UWMP Projected Population and Average-Year Water Supply and Demand Summary</td>
<td>5-14</td>
</tr>
<tr>
<td>5-8</td>
<td>District Water Master Plan Projected Average-Year Supplies</td>
<td>5-16</td>
</tr>
<tr>
<td>5-9</td>
<td>Agencies with the Authority to Implement or Require Implementation of Measures to Avoid or Mitigate Growth-Related Impacts</td>
<td>5-24</td>
</tr>
<tr>
<td>6-1</td>
<td>List of Projects Evaluated for Cumulative Impacts in the WPCP Project Vicinity</td>
<td>6-3</td>
</tr>
<tr>
<td>6-2</td>
<td>Summary of Master Plan’s Contribution to Cumulative Impacts</td>
<td>6-9</td>
</tr>
<tr>
<td>7-1</td>
<td>City of Sunnyvale Master Plan Objectives</td>
<td>7-2</td>
</tr>
<tr>
<td>7-2</td>
<td>Summary of Action Alternatives</td>
<td>7-7</td>
</tr>
<tr>
<td>7-3</td>
<td>District Water Purification Facilities Objectives</td>
<td>7-9</td>
</tr>
<tr>
<td>7-4</td>
<td>Impacts of Alternatives 2 through 5 Compared to the Project</td>
<td>7-25</td>
</tr>
</tbody>
</table>
SUMMARY

<table>
<thead>
<tr>
<th>Sections</th>
<th>Tables</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.1 Summary Project Description</td>
<td>S-1 Summary of Action Alternatives</td>
</tr>
<tr>
<td>S.2 Summary of Impacts and Mitigation Measures</td>
<td>S-2 Summary of Impacts and Mitigation Measures for the Sunnyvale Water Pollution Control Plant Master Plan</td>
</tr>
<tr>
<td>S.3 Summary of Alternatives</td>
<td>S-3 Summary of Impacts and Mitigation Measures for the Water Purification Facilities</td>
</tr>
<tr>
<td>S.4 Areas of Controversy and Issues to be Resolved</td>
<td></td>
</tr>
</tbody>
</table>

S.1 Summary Project Description

S.1.1 Background

The City of Sunnyvale (City) owns and operates the Donald M. Somers Water Pollution Control Plant (WPCP), which provides treatment of wastewater flows and loads from domestic, commercial, and industrial sources in Sunnyvale, Rancho Rinconada, and Moffett Field. The WPCP includes an approximately 16.6-acre main plant and two oxidation ponds\(^1\) that occupy about 436 acres in total. The WPCP was originally constructed in 1956. With the enactment of the Clean Water Act in 1972, more restrictive water quality standards were established, leading to expansion of and process upgrades to the WPCP. Currently (2016), the WPCP processes about 14.5 million gallons per day (mgd) average dry weather flow.\(^2\)

S.1.2 Master Plan

The City has prepared a Master Plan to provide a central planning document to guide improvements to the WPCP’s facilities and operations over the next 20 or more years (through the year 2035). The Master Plan was developed to address several challenges facing the WPCP today and into the future, as well as to support City policies. The Master Plan (and its predecessor, the Strategic Infrastructure Plan) identifies capital improvement projects, estimates costs, and recommends implementation approaches to achieve the planning objectives. The City has prepared this draft program environmental impact report (PEIR) for the Master Plan in compliance with the California Environmental Quality Act (CEQA) and the CEQA Guidelines.

\(^1\) Oxidation ponds are bodies of wastewater where oxygen is added to the water to promote the growth of algae and microorganisms, which consume solids and nutrients.

\(^2\) Average dry weather flow, or ADWF, is the average of the daily average flow during the three month period between June and September (the driest times of the year in Sunnyvale) that produces the minimum flow.
S.1.3 Project Objectives

The City established overall planning objectives for the WPCP Master Plan in 2013. These planning objectives include:

- Develop process improvements to meet current and foreseeable water quality, biosolids, and air quality requirements.
- Identify process improvements that are cost effective, incorporate innovative solutions and technologies, and promote City goals to maximize water recycling opportunities.
- Provide the WPCP with a more reliable power supply through renewable energy generation that provides means to meet future heat and power demands.
- Maximize the use of available space, enhance safety through improved traffic circulation and access, and improve public access to the WPCP while ensuring site security.
- Maintain wastewater operations to meet regulatory standards during the course of implementing the Master Plan improvements.
- Provide flexibility in responding to financial and regulatory uncertainty.
- Maximize the useful life of the existing WPCP facilities in a manner that minimizes rate impacts while maintaining regulatory compliance.
- Incorporate a level of redundancy which provides operations and maintenance flexibility to deal with planned and unplanned process downtime.
- In partnership with other agencies, protect the WPCP from flooding and risks associated with sea level rise.
- Minimize life-cycle costs (capital and operation and maintenance) to City rate payers.

S.1.4 Project Characteristics

The WPCP is located at 1444 Borregas Avenue in the City of Sunnyvale, Santa Clara County, California (see Figures S-1 and S-2). The area of the WPCP, including the main plant, oxidation ponds and recirculation channels, totals about 453 acres.

As described in Chapter 3, Project Description, the Master Plan includes rehabilitation of existing facilities and construction of new facilities throughout the WPCP’s major process areas, including secondary treatment, tertiary treatment, solids processing, energy processes, and support facilities (new administration and maintenance buildings, support utility rehabilitation, and improvements to parking and site access). Some existing facilities would be decommissioned and demolished to

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3 Biosolids are the organic solid product produced by wastewater treatment processes that can be beneficially reused.

4 Secondary treatment involves the removal of dissolved and suspended (non-settleable) solids from wastewater. This occurs through a combination of natural and engineered processes.

5 The goal of tertiary treatment is to remove pollutants remaining after secondary treatment (ammonia, algae, and bacteria) and disinfect the water prior to discharge or reuse.
SOURCE: Thomas Brothers; ESA

Figure S-1
Site Location Map
Figure S-2
Sunnyvale Water Pollution Control Plant Area Map

SOURCE: H.T. Harvey & Associates; adapted by ESA
create space for construction of new facilities. Construction would occur throughout the main plant as well as within the oxidation ponds area. As part of the project, the City proposes to close Carl Road west of Borregas Avenue and relocate access to the San Francisco Bay Trail and other neighboring trails to accommodate proposed changes at the WPCP and ensure site security. Trail access would be relocated to Caribbean Drive at the Sunnyvale West Channel, southwest of the main plant.

The proposed staging of improvements to secondary treatment would involve transitioning to a conventional activated sludge treatment process, constructing storage facilities in Pond 1, and operating existing and proposed treatment trains in parallel for about 10 years. As a result of proposed changes to secondary treatment operations, the City would ultimately consolidate wastewater treatment operations from about 453 acres to about 51 acres, which would allow most of the oxidation pond area (about 400 acres) to be decommissioned. The City proposes to explore opportunities for habitat restoration following decommissioning of the oxidation ponds. In addition, the City is proposing to construct a flood wall with retractable flood gates around the main plant area to address tidal flood hazards, as well as flood protection (levees) for storage facilities (diurnal equalization and emergency storage) that would be constructed within Pond 1.

Construction would occur over the next 20 or more years. The relatively small size of the main plant area and the need to maintain continuous operations 24 hours per day, seven days per week, largely determines the phasing of Master Plan implementation. Other factors that determine the overall proposed schedule include cost, the timing of future regulations (such as new discharge requirements for nutrient removal), and projected increases in wastewater flows and loads.

### S.1.2 Water Purification Facilities

The City is partnering with the Santa Clara Valley Water District (District) to propose a variation of the Master Plan that includes Water Purification Facilities (WPF) to increase the production and distribution of recycled water in Sunnyvale and other parts of Santa Clara County. The primary purpose of the WPF is to augment groundwater levels in the Santa Clara Valley. The WPF would include construction and operation of advanced water purification facilities at the WPCP, many of which would be in place of treatment facilities proposed under the Master Plan. The WPF would produce purified water that the District would use to recharge groundwater via existing recharge basins and proposed injection wells. The City and the District would repurpose existing pipelines or construct new pipelines to convey the purified water from the WPCP to recharge basins and injection wells to be located several miles south of the WPCP.

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6 The conventional activated sludge process is a commonly used method to remove the soluble/non-settleable organic solids from primary effluent with the assistance of microorganisms.
S.2 Summary of Impacts and Mitigation Measures

Table S-2 (at the end of this chapter) summarizes all of the environmental impacts identified for the proposed Master Plan in this PEIR, identifies the significance determination for each impact, and presents the full text of the mitigation measures identified to avoid, reduce or otherwise lessen significant impacts. A complete description of the Master Plan and its impacts and proposed mitigation measures can be found in the text of the PEIR following this summary. As shown in the table, implementation of the Master Plan was determined to result in significant and unavoidable impacts in the areas of air quality, biological resources, and secondary effects of growth.

Table S-3 summarizes the significant environmental impacts identified in this PEIR for implementation of the proposed WPF, as well as mitigation measures to avoid or reduce those impacts. In addition to the significant and unavoidable impacts identified above for the Master Plan, implementation of the WPF could result in a significant and unavoidable impact in the area of noise. A complete description of the WPF and of its impacts and proposed mitigation measures can be found in the text of the PEIR following this summary.

S.3 Summary of Alternatives

A screening process was conducted to identify alternatives to the proposed project to be considered in the PEIR. The screening process involved reviewing the significant impacts attributable to Master Plan implementation (described in Chapters 4, 5 and 6 of the PEIR); reviewing comments received during circulation of the Notice of Preparation (presented in Appendix A); evaluating the feasibility of potential alternatives; and considering the ability of potential alternatives to meet most of the basic objectives of the Master Plan (presented above in Section S.1). The screening process indicated that many of the long-term, significant impacts expected to occur to the natural environment would be associated with development within and near the oxidation ponds, particularly construction and operation of the proposed diurnal equalization and emergency storage basins and access road. Numerous alternatives were considered but eliminated from further consideration because of infeasibility, inability to reduce significant environmental impacts, or inability to meet most of the basic objectives or the project. The alternatives selected for evaluation in the PEIR include the No Project Alternative (as required by CEQA), and four “action” alternatives, described below and in Table S-1:

1. **No Project.** This alternative describes conditions that would generally be expected to occur without implementation of the project, and includes two variations: (1) No Master Plan, and (2) No Water Purification Facilities.

2. **Realigned Access Road.** This alternative involves realigning the access road to proposed diurnal equalization and emergency storage.

3. **Diurnal Equalization/Emergency Storage in Pond 2.** This alternative involves development of diurnal equalization and emergency storage facilities within Pond 2 instead of Pond 1.
4. **Diurnal Equalization/Emergency Storage in SCVWD Pond A4.** This alternative involves development of diurnal equalization and emergency storage facilities within Pond A4 instead of Pond 1.

5. **Construction Emissions Reduction.** This alternative involves reducing construction-phase criteria air pollutant emissions below significant levels by mandating the type of construction equipment used and implementation of a Construction Emissions Minimization Plan. Alternative 5 could be combined with alternatives 2 through 4.

### TABLE S-1
**SUMMARY OF ACTION ALTERNATIVES**

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Plant</strong></td>
<td>Secondary, Tertiary, Solids, Energy, Flood Wall</td>
<td>Same as the Master Plan</td>
<td>Implement within Pond 2 instead of Pond 1 with associated new access road</td>
<td>Implement within SCVWD Pond A4 instead of Pond 1 with associated new access road</td>
<td>Use of Tier 4(^b) program engines, implementation of Construction Emissions Minimization Plan.</td>
</tr>
<tr>
<td><strong>Oxidation Ponds</strong></td>
<td>Diurnal Equalization, Emergency Storage</td>
<td>Shift location of access road improvements to the west</td>
<td>Refer to Figure 7-2(^a) for revised area to be restored.</td>
<td>Refer to Figure 7-3(^a) for revised area to be restored.</td>
<td>Same as Master Plan for main plant; see Figure 7-2 for flood protection for diurnal EQ/emergency storage.</td>
</tr>
<tr>
<td><strong>Decommissioning of Ponds 1 and 2</strong></td>
<td>Same as Master Plan</td>
<td></td>
<td></td>
<td></td>
<td>Same as Master Plan for main plant; see Figure 7-3 for flood protection for diurnal EQ/emergency storage.</td>
</tr>
<tr>
<td><strong>Tidal Flood Protection</strong></td>
<td>Similar to the Master Plan, but shifted inland</td>
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<td></td>
<td>Same as Master Plan for main plant; see Figure 7-2 for flood protection for diurnal EQ/emergency storage.</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Bay Trail Access Relocation, Administration and Maintenance Buildings</td>
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<td>Same as Master Plan</td>
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</tbody>
</table>

**NOTES:**

\(^a\) Figures referenced in this table are presented in Chapter 7, Alternatives.

\(^b\) Amendments to the Clean Air Act in 1990 defined the use of “tiers” to refer to stages of implementation of vehicle emission standards. The Tier 1 standard was in place until 2004, when more stringent Tier 2 emissions standards became effective, which was subsequently replaced with the Tier 3 standards. The Tier 4 emissions standards for off-road engines began implementation in model year 2008 for certain engines and for all engines types in 2012.

Chapter 7 presents the approach to alternatives selection, descriptions of the alternatives, impacts associated with the alternatives, and alternatives considered but eliminated from consideration. As described in Chapter 7, Alternative 3, in combination with Alternative 5, is considered the environmentally superior alternative.
S.4 Areas of Controversy and Issues to be Resolved

S.4.1 Areas of Controversy

Pursuant to CEQA Guidelines Section 15123(b)(1), EIRs are required to identify areas of controversy known to the lead agency including issues raised by agencies and the public. A Notice of Preparation (NOP, presented in Appendix A) was circulated to local, state, and federal agencies beginning on June 15, 2015 to solicit input on the scope and content of this PEIR. Comments were accepted until July 15, 2015. The City also conducted two public meetings, on June 24, 2015, to present the Master Plan, the NOP and the CEQA Process. Comments were received from the County of Santa Clara Department of Environmental Health, California Department of Transportation, and State Water Resources Control Board Division of Safe Drinking Water and Division of Financial Assistance. No comments were received from City of Sunnyvale residents. In general, issues raised during the scoping period pertain to the disposition of treated biosolids, the authority of state agencies over aspects of the Master Plan, traffic on state highways, transportation of hazardous materials, and funding. Environmental issues raised in the comments are addressed in Chapter 3, Project Description, and in the discussions of impacts and mitigation measures presented in Chapter 4 of this PEIR.

S.4.2 Issues to be Resolved

Pursuant to state CEQA Guidelines Section 15123(b)(3), an EIR shall identify issues to be resolved. Below are issues to be resolved for the Master Plan.

- **Water Purification Facilities.** If, following certification of the PEIR, the City and District continue to pursue the WPF, there are numerous issues that would be resolved through completion of preliminary engineering and other studies (described briefly in Section 2.3, Chapter 2), including identification of facility sites, development of facility design and operating characteristics, evaluation and selection of reverse osmosis concentrate management options, and completion of project-level CEQA.

- **Proposed changes to Oxidation Ponds.** Aspects of the Master Plan involving the oxidation ponds, including restoration, flood control, and the proposed diurnal equalization and emergency storage facilities, will require coordination with and approvals from agencies such as the US Fish and Wildlife Service, US Army Corps of Engineers, Regional Water Quality Control Board, Bay Conservation and Development Commission, the District, and other agencies involved in the South Bay Shoreline Study. Coordination with these agencies will influence how these components of the Master Plan are implemented.
### TABLE S-2
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance after Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land Use and Recreation</strong></td>
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<tr>
<td>Impact LU-1: The Master Plan would be consistent with local plans and policies, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact LU-2: The Master Plan would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-LU-1: Implementation of the Master Plan, in combination with other projects, could result in cumulative impacts related to land use, agricultural resources, and recreational resources.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
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<td><strong>Transportation</strong></td>
<td></td>
<td>Less than Significant</td>
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<tr>
<td>Impact TR-1: The activities associated with the project would temporarily reduce roadway capacity and increase traffic delays on area roadways, which could conflict with applicable measures of effectiveness for the performance of the circulation system, a less-than-significant impact with mitigation.</td>
<td><strong>Mitigation Measure TR-1a: Truck Route Plan.</strong>&lt;br&gt;As part of pre-construction submittals, the contractor(s) shall submit a truck route plan to the City of Sunnyvale Public Works Department for review and approval to help minimize impacts to adjacent roadways.</td>
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<td><strong>Mitigation Measure TR-1b: Implement a Temporary Traffic Control Plan.</strong>&lt;br&gt;The City contractor(s) shall prepare and implement a traffic control plan using the City’s Temporary Traffic Control guidelines to reduce traffic impacts on the roadways at and near the work site, as well as to reduce potential traffic safety hazards and ensure adequate access for emergency responders. The City shall coordinate development and implementation of this plan with City departments (e.g., Emergency Services, Fire, Police, Transportation), as appropriate. To the extent applicable, the traffic control plan shall conform to the Caltrans’ <em>California Manual on Uniform Traffic Control Devices</em>, Part 6 (Temporary Traffic Control; Caltrans, 2014). The traffic control plan shall include, but not be limited to, the following elements:</td>
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<td>• Circulation and detour plans to minimize impacts on local road circulation during road and lane closures. Flaggers and/or signage shall be used to guide vehicles through and/or around the construction zone.</td>
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<td>• Controlling and monitoring construction vehicle movement through the enforcement of standard construction specifications by onsite inspectors.</td>
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<td>• Sufficient staging areas for trucks accessing construction zones to minimize disruption of access to adjacent public rights-of-way.</td>
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<td>• Scheduling truck trips outside the peak morning and evening commute hours to the extent possible.</td>
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### TABLE S-2 (Continued)

#### SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance after Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation (cont.)</td>
<td></td>
<td></td>
</tr>
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| **Impact TR-1 (cont.)** | • Maintaining pedestrian and bicycle access and circulation during project construction where safe to do so. If construction activities encroach on bicycle routes or multi-use paths, advance warning signs (e.g., “Bicyclists Allowed Use of Full Lane” and/or “Share the Road”) shall be posted that indicate the presence of such users.  
• Identifying detours for bicycles and pedestrians, where applicable, in all areas affected by project construction.  
• Implementing roadside safety protocols. Advance “Road Work Ahead” warning and speed control signs (including those informing drivers of State legislated double fines for speed infractions in a construction zone) shall be posted to reduce speeds and provide safe traffic flow through the work zone.  
• Coordinating construction with administrators of police and fire stations (including all fire protection agencies), and recreational facility managers. Operators shall be notified in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures, where applicable.  
• Storing all equipment and materials in designated contractor staging areas on or adjacent to the worksite, such that traffic obstruction is minimized. | | |
| **Impact TR-2:** The project would increase traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways due to roadway design features, incompatible uses, or project-related vehicle trips, a less-than-significant impact with mitigation. | Implement Mitigation Measure TR-1b (Implement a Temporary Traffic Control Plan). | Less than Significant |
| **Impact TR-3:** The project could result in inadequate emergency access, a less-than-significant impact with mitigation. | Implement Mitigation Measure TR-1b (Implement a Temporary Traffic Control Plan). | Less than Significant |
| **Impact TR-4:** The project would not conflict with adopted policies, plans, and programs supporting alternative transportation, or decrease the performance or safety of such facilities, a less-than-significant impact. | None required. | Less than Significant |
| **Impact C-TR-1:** Implementation of the Master Plan and WPF, in combination with other projects, could result in cumulative impacts related to transportation, a less-than-significant impact with mitigation. | Mitigation Measure C-TR-1: Implement Coordinated Transportation Management Plan. Prior to construction, the City’s or District’s respective contractor(s) shall develop a Coordinated Transportation Management Plan, and the City/District and its contractor(s) shall work with other projects’ contractors and appropriate County and/or City departments (e.g., Emergency Services, Fire, Police, Transportation) to prepare and implement a transportation management plan for roadways adjacent to and directly affected by the Master Plan improvements or the WPF, and to address the transportation impact of the overlapping construction projects within the vicinity of the Master Plan or the WPF in the region. The transportation management plan shall include, but not be limited to, the following requirements: | Less than Significant |
TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

<table>
<thead>
<tr>
<th>Impacts</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Transportation (cont.)</td>
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<tr>
<td>Impact C-TR-1 (cont.)</td>
<td>• Coordination of individual traffic control plans for the Master Plan or WPF with nearby projects.</td>
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<td>• Coordination between the contractor and other project contractors in developing circulation and detour plans that include safety features (e.g., signage and flaggers). The circulation and detour plans shall address:</td>
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<td>- Full and partial roadways closures</td>
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<td>- Circulation and detour plans to include the use of signage and flagging to guide vehicles through and/or around the construction zone, as well as any temporary traffic control devices</td>
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<td>- Bicycle/Pedestrian detour plans, where applicable</td>
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<td>- Parking along public roadways</td>
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<td>- Haul routes for construction trucks and staging areas for instances when multiple trucks arrive at the work sites</td>
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<td>- Protocols for updating the transportation management plan to account for delays or changes in the schedules of individual projects.</td>
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<tr>
<td>Noise and Vibration</td>
<td>Mitigation Measure NOI-1: Develop and Implement Construction Noise Logistics Plan.</td>
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<tr>
<td>Impact NOI-1: Demolition and construction associated with the implementation of the WPCP improvements would result in temporary increases in ambient noise levels in the WPCP vicinity above existing noise levels and could generate noise levels in excess of standards established in the City of Sunnyvale General Plan and Municipal Code, a less-than-significant impact with mitigation.</td>
<td>For any Master Plan improvements involving construction activities at, or truck trips to or from, the WPCP between the hours of 6:00 p.m. and 7:00 a.m., the City will incorporate into the contract specifications required compliance with a Construction Noise Logistics Plan developed by the City or its contractor, which will specify hours of construction, identify noise and vibration minimization measures, require posting or notification of construction schedules and hours, and identify a designated noise disturbance coordinator who shall respond to noise complaints. The Plan shall include measures such as, but not limited to the following:</td>
<td>Less than Significant</td>
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<td>• Consistent with Section 16.08.030 of the Sunnyvale Municipal Code, all noise generating construction activities at the project site shall be limited to the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday and between 8:00 a.m. and 5:00 p.m. on Saturdays as much as possible. There shall be no construction activity at the project site on Sundays and national holidays when city offices are closed. Any critical construction activities that will need to take place outside the hours stated above shall be completed as expeditiously as possible to reduce the duration of the impact. No extreme noise generating activities at the project site shall take place outside the hours listed above.</td>
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<td>• Any onsite construction activities that will need to take place outside the above mentioned hours will need prior approval from the City.</td>
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<td>• Signs shall be posted at the construction site that include construction days and hours, a day and evening contact number for the job site, and a day and evening contact number for the City in the event of problems.</td>
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<td>• All construction vehicles and equipment, fixed and mobile, shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).</td>
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TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<tr>
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<tr>
<td><strong>Noise and Vibration (cont.)</strong></td>
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| **Impact NOI-1 (cont.)** | • Construction staging areas shall be located as far as practicable from existing recreational uses so as to cause minimal disruption to these activities.  
• Construction traffic to and from the project site shall be routed via designated truck routes that use freeways to the extent possible. Trucks shall not traverse through or adjacent to any residential areas, including along Lawrence Expressway, between the hours of 6:00 p.m. and 7:00 a.m. Preferred access to the site shall be from SR-237 through Caribbean Drive or North Mathilda Avenue.  
• Prohibit unnecessary idling of internal combustion engines. | None required.  
Less than Significant |
| **Impact NOI-2: Construction and operation of the WPCP improvements under the Master Plan would not expose persons to or generate excessive groundborne noise or vibration, a less-than-significant impact.** | None required. | None required.  
Less than Significant |
| **Impact NOI-3: Daily operational activities associated with the Master Plan would not result in a substantial permanent increase in ambient noise levels above existing levels, a less-than-significant impact.** | None required. | None required.  
Less than Significant |
| **Impact C-NOI-1: Implementation of the Master Plan, in combination with other projects, could result in cumulative impacts related to noise.** | No additional mitigation required. | No additional mitigation required.  
Less than Significant |
| **Air Quality** | | |
| **Impact AQ-1: Implementation of the Master Plan would generate emissions that would conflict with the 2010 Clean Air Plan, a significant and unavoidable impact.** | Implement Mitigation Measures AQ-2a (Implement BAAQMD Basic Construction Mitigation Measures) and AQ-2b (Implement BAAQMD Additional Construction Mitigation Measures). | Significant and Unavoidable |
| **Impact AQ-2: Construction activities associated with Master Plan improvements would generate emissions that could contribute to air quality violations; with mitigation the impact would be less-than-significant for all improvements except for Stages 1A, 4A, 5A which would be significant and unavoidable.** | Mitigation Measure AQ-2a: Implement BAAQMD Basic Construction Mitigation Measures.  
The City shall implement the following applicable BAAQMD Basic Construction Mitigation Measures to reduce emissions of fugitive dust and equipment exhaust:  
• All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.  
• All haul trucks transporting soil, sand, or other loose material offsite shall be covered. | Less than Significant, except for Stages 1Aand 4A, which would be significant and unavoidable. |
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<td>Air Quality (cont.)</td>
<td>All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.</td>
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<td>All vehicle speeds on unpaved roads shall be limited to 15 mph.</td>
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<td>All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.</td>
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<td>Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.</td>
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<td>All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified visible emissions evaluator.</td>
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<td>Post a publicly visible sign with the telephone number and person to contact at the City regarding dust complaints. This person shall respond and take corrective action within 48 hours.</td>
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<td>Mitigation Measure AQ-2b: Implement BAAQMD Additional Construction Mitigation Measures</td>
<td>The City shall implement the following applicable BAAQMD Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Thresholds to further reduce emissions of fugitive dust and exhaust:</td>
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<td>All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.</td>
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<td>All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.</td>
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<td>Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.</td>
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<td>Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.</td>
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<td>The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.</td>
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<td>All trucks and equipment, including their tires, shall be washed off prior to leaving the site.</td>
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<td>Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.</td>
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### TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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| Impact AQ-2 (cont.) | • Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.  
• Minimizing the idling time of diesel powered construction equipment to two minutes.  
• The City shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NOx reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of newer model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.  
• All construction equipment, diesel trucks, and generators must be equipped with Best Available Control Technology for emission reductions of NOx and PM.  
• All contractors must use equipment that meets CARB’s most recent certification standard for off-road heavy duty diesel engines. | |
<p>| Impact AQ-3: Operational activities associated with the Master Plan improvements would generate emissions that could contribute to air quality violations, a less-than-significant impact. | None required. | Less than Significant |
| Impact AQ-4: Construction and operation of the proposed Master Plan improvements would expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions, a less-than-significant impact. | None required. | Less than Significant |
| Impact AQ-5: Implementation of the Master Plan improvements would create odors that could affect nearby sensitive receptors, a less-than-significant impact. | None required. | Less than Significant |
| Impact C-AQ-1: Implementation of the Master Plan would have a considerable contribution to cumulative air quality impacts in the region, a significant and unavoidable impact. | No additional mitigation required. | Significant and Unavoidable |</p>
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<td><strong>Greenhouse Gas Emissions</strong></td>
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<td><strong>Impact GHG-1:</strong> Implementation of the WPCP improvements would not conflict with the Sunnyvale Climate Action Plan, or the GHG reduction goals set forth in AB 32, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
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<tr>
<td><strong>Impact GHG-2:</strong> Implementation of the Master Plan improvements would generate greenhouse gas emissions, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
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<tr>
<td><strong>Impact C-GHG-1:</strong> Implementation of the Master Plan, in combination with other projects, could result in cumulative impacts on GHG emissions.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
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<tr>
<td><strong>Biological Resources</strong></td>
<td><strong>Mitigation Measure BIO-1a: Reduce Impacts on Congdon’s Tarplant</strong></td>
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<td><strong>Impact BIO-1:</strong> The Master Plan could result in the loss of or damage to special-status plants, a less-than-significant impact with mitigation.</td>
<td>• Within 2 years prior to initial ground disturbance, the City will retain a qualified biologist, or require the contractor to retain a qualified biologist, to conduct protocol-level surveys for Congdon’s tarplant in the Master Plan area, including vegetated areas both within and outside the main plant fenceline. These surveys will be conducted in accordance with the protocols established by the CDFW and CNPS, and shall coincide with the bloom period for the species (May through November).&lt;br&gt;• If Congdon’s tarplant is present in the Master Plan area, the City contractor will avoid impacts on individuals of this species to the extent feasible during implementation of the Master Plan.&lt;br&gt;• If Congdon’s tarplant is present near the limits of disturbance, the City contractor will maintain a buffer free from construction-related activities around the tarplant occurrence; this buffer will be at least 50 feet if feasible, but large enough to avoid indirect impacts such as dust mobilization and alteration of hydrology. The City contractor shall demarcate the buffer in the field with orange fencing. No equipment, vehicles, or personnel shall be permitted within the buffer area during construction.&lt;br&gt;• If 15 percent or more of the known population of Congdon’s tarplant within five miles of the Master Plan area at the time of impact would be affected by the Master Plan, the City will provide compensatory mitigation. To compensate for loss of individual Congdon’s tarplants, offsite habitat either occupied by the species or suitable for restoration to support the species and revegetated with this species (such as Sunnyvale Baylands Park) shall be preserved and managed in perpetuity at a minimum 1:1 mitigation ratio (at least one plant preserved for each plant affected). Seeds from the affected population shall be collected and used to seed the mitigation area.</td>
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<td>Impacts</td>
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<td><strong>BIO-1 (cont.)</strong></td>
<td>Mitigation Measure BIO-1b: Prevent the Introduction and Spread of Non-native, Invasive Species</td>
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<td>• The City will retain a qualified biologist, or require the contractor to retain a qualified biologist, to develop an Invasive Species Management Plan to reduce the presence and spread of non-native, invasive plant species in the Master Plan area. The Invasive Species Management Plan shall be developed prior to any grading activities and prior to importing any fill material to the project areas, either within the main plant or outside of the main plant fenceline. The overarching goal of this mitigation is to halt the further expansion of existing invasive species and introduction of new invasives into sensitive habitats in project areas. The Invasive Species Management Plan shall include, but not be limited to, the following:</td>
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<td>− Prior to construction, the extent and locations of invasive species occurrences will be mapped within all areas proposed to be graded, including access roads and staging areas, and within all sensitive habitats (e.g., wetlands) across the project areas. This mapping will include project areas both within the main plant (especially along the fenceline) and outside the main plant fenceline, such as the access roads to Ponds 1 and 2.</td>
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<td>− Areas identified to have weed infestations shall be treated prior to ground disturbance according to weed control methods detailed below:</td>
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<td>• Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods approved for application. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the City of Newark, and implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 72 hours of a scheduled rain event. Where manual and/or mechanical methods are used, disposal of the plant debris will take place at an appropriate offsite location. The timing of the weed control treatment shall be determined for each plant species with the goal of controlling populations before they start producing seeds and/or encroach into adjacent areas from rhizomatous shoots. Consultation with a qualified wildlife biologist and plant ecologist shall be required prior to weed control treatments in sensitive habitats with the intent of avoiding any adverse impacts on special-status species in the area.</td>
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<td>• Surveying and monitoring for weed infestations shall occur over the course of any grading operations along and outside the main plant fenceline. Treatment of all identified weed populations shall occur at a minimum of once annually.</td>
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<td>• Once grading ceases, invasive plant populations within all sensitive habitats (such as wetlands) that are not impacted, but that are within 200 feet of grading/construction areas, shall be mapped and the aerial extent and location of invasive populations documented. Sensitive habitats within 200 feet of construction areas include portions of the Sunnyvale West Channel, the Cargill Channel, Ponds 1 and 2, and SCVWD Pond A4. This shall occur on an annual basis for a minimum of 3 years following grading operations.</td>
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### TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<td><strong>Impact BIO-1 (cont.)</strong></td>
<td>− If, in any monitoring year, the size of existing populations within sensitive habitats expands by 20 percent or more in terms of surface area in comparison to the population size documented prior to construction, the weed control measures described above shall be implemented (inter-annual variation due to climate differences may account for as much as 10 percent of change).&lt;br&gt;− During construction activities, all seeds and straw materials used on site shall be weed-free rice straw, and all gravel and fill material shall be certified weed free.&lt;br&gt;• During construction activities along and outside the main plant fenceline, vehicles and all equipment shall be washed (including wheels, undercarriages, and bumpers) before entering the project areas. Vehicles shall be cleaned at existing construction yards or legally operating car washes. The project proponent shall document all vehicles have been washed prior to commencing work. In addition, tools such as chainsaws, hand clippers, pruners, etc., shall be washed before entering the work areas.</td>
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<tr>
<td><strong>Impact BIO-2: The Master Plan could result in the loss of or damage to special-status wildlife species, a less-than-significant impact with mitigation.</strong></td>
<td><strong>Mitigation Measure BIO-2a: Worker Environmental Awareness Training.</strong>&lt;br&gt;The City will retain, or require the contractor to retain, a qualified biologist to conduct mandatory contractor/worker environmental awareness training for all construction personnel working on project activities outside of the main plant, including but not limited to Ponds 1 and 2, the diurnal equalization and emergency storage basins, channel levees, and the Bay Trail parking relocation area. The awareness training will be provided to all construction personnel to brief them on the potential for special-status species to occur on the site, the need to avoid effects to special-status species and their habitats, and all project mitigation measures pertaining to biological resources and water quality. If new construction personnel are added, the contractor will ensure that the personnel receive the mandatory training before starting work. A representative will be appointed during the employee education program to be the contact for any employee or contractor who might inadvertently kill or injure a special-status species or who finds a dead, injured, or entrapped individual. The representative's name and telephone number will be provided to the City prior to the initiation of construction activities outside of the main plant.&lt;br&gt;&lt;br&gt;<strong>Mitigation Measure BIO-2b: Minimization of Impacts on Water Quality</strong>&lt;br&gt;The following measures will be incorporated into the construction stormwater pollution prevention plan and implemented during construction of Master Plan improvements to avoid or minimize impacts on water quality:&lt;br&gt;• Earth-moving in areas draining to wetlands and aquatic habitats will not occur during days when rain is occurring or predicted to occur (i.e., greater than 30 percent chance) during the work period. This measure applies to all Project areas with potential to drain to wetlands or aquatic habitats, particularly in or adjacent to the Southeast Channel, the Sunnyvale West Channel, the Cargill Channel, Ponds 1 and 2, and SCVWD Pond A4.</td>
<td><strong>Less than Significant</strong></td>
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### TABLE S-2 (Continued)

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<td><strong>Biological Resources (cont.)</strong></td>
<td><strong>Impact BIO-2 (cont.)</strong></td>
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<td>• All permit conditions, legal requirements, and appropriate dredging and engineering practices shall be followed to avoid and minimize water quality impacts associated with Master Plan activities. Suitable erosion control, sediment control, source control, treatment control, material management, and stormwater management BMPs will be implemented consistent with the latest edition of the California Stormwater Quality Association “Stormwater Best Management Practices Handbook,” available at <a href="http://www.capmphandbooks.com">www.capmphandbooks.com</a>.</td>
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<td>• Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). Feasible measures shall be implemented to ensure that hazardous materials are properly handled and the quality of aquatic resources is protected by all reasonable means when removing vegetation and sediments from the channels.</td>
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<td>• No fueling shall be done in areas immediately adjacent to (i.e., within 50 feet of) channels, ponds, or wetlands. For stationary equipment that must be fueled on site, containment shall be provided in such a manner that any accidental spill of fuel shall not be able to enter the water or contaminate sediments that may come in contact with water. Any equipment that is readily moved out of the channels, ponds, or wetlands shall not be fueled in these sensitive habitat areas or the immediate floodplains surrounding them.</td>
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<td>• A hazardous materials management/fuel spill containment plan will be developed and implemented by the construction contractor and given to all contractors and biological monitors working on the Master Plan, with at least one copy of the plan located onsite at all times. The purpose of the plan is to provide onsite construction managers, environmental compliance monitors, and regulatory agencies with a detailed description of hazardous materials management, spill prevention, and spill response/cleanup measures associated with the construction of Master Plan elements. The primary objective of the plan is to prevent a spill of hazardous materials. Elements of the plan will include, but are not limited to the following:</td>
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<td>− A discussion of hazardous materials management, including delineation of hazardous material and hazardous waste storage area, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas;</td>
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<td>− Materials Safety Data Sheets for all chemicals used and stored on site;</td>
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<td>− An inventory list of emergency equipment;</td>
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<td>− Spill control and countermeasures including employee spill prevention/response training;</td>
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<td>− Notification and documentation procedures; and</td>
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<td>− A monthly reporting plan.</td>
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<td>• Vehicles will be checked daily for oil or fuel leaks and will be washed only at an approved area as described above for Mitigation Measure BIO-1b. No washing of vehicles will occur in Master Plan areas located outside of the main plant fenceline.</td>
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### TABLE S-2 (Continued)
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<td>Impact BIO-2 (cont.)</td>
<td>• The work site, areas adjacent to the site, and access areas will be maintained in an orderly condition, free and clear from debris and discarded materials. This measure includes all Master Plan areas located outside of the main plant fenceline. Personnel will not sweep, grade, or flush surplus materials, rubbish, debris, or dust onto adjacent areas or waterways. Upon completion of work, all building materials, debris, unused materials, concrete forms, and other construction-related materials will be removed from the Master Plan areas located outside of the main plant fenceline.</td>
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<td>• Stockpiled materials outside of the main plant fenceline will be covered by plastic sheeting, tarps, or similar material that can be secured during wind and rain. A sediment fence or berm will be installed around stockpiled dredged material to prevent runoff from transporting sediment into sensitive habitats (such as the channels, ponds, and wetlands). Heavy equipment will not be operated in the active channels or within wetland habitats, but instead from existing hardscape, access roads, and levees.</td>
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<td>• Water conservation methods will ensure that water used in the Master Plan area does not create surface flows capable of carrying pollutants to the nearby creek channel. All personnel, including sub-contractors will be instructed on the practical methods of preventing leaks or over-use of watering, and will be required to adhere to the practices in the detail sheets provided. Woody debris from tree trimming and other activities will not be left in the active channels or in wetland habitats.</td>
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<td>• In-channel vegetation removal may result in increased local erosion in the channels due to increased flow velocity. To minimize such erosion, the toe of the bank will be protected by leaving vegetation within the channel to the maximum extent practicable.</td>
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<td>• Cofferdams or silt fencing will be used to the extent feasible during construction and maintenance activities that could potentially result in substantial siltation of open water. For any work within aquatic or wetland habitats, such as Ponds 1 and 2 or the Cargill Channel, silt curtains will be installed to prevent suspended sediments from migrating out of the immediate work area, and dredging will be conducted on incoming tides to the extent feasible to further reduce the potential for sediment mobilization outside the Master Plan area. Dredging within aquatic or wetland habitats will be conducted with a closed clamshell-style dredge to reduce the amount of suspended sediment produced. Dredge volumes will be documented to ensure compliance with and adequate performance of these measures.</td>
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<td><strong>Mitigation Measure BIO-2c: Special-Status Fish Measures</strong></td>
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<td>The following measures will be implemented during construction of the Master Plan to avoid or minimize impacts on special-status fish species:</td>
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<td>• Impacts on tidal waters where special-status fish and Essential Fish Habitat may occur will be minimized to the extent feasible.</td>
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<td>• Construction activities in, or directly adjacent to, waters where green sturgeon, longfin smelt, steelhead, or Chinook salmon may be present will be performed between June 1 and November 30. These waters include but are not limited to the Moffett Channel and the Sunnyvale West Channel.</td>
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### TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance after Mitigation</th>
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<tbody>
<tr>
<td>Biological Resources (cont.)</td>
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<td>Impact BIO-2 (cont.)</td>
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<td>• Activities that extend into the waters where special-status fish may be present, such as levee breaching for active restoration of Ponds 1 and 2, will be performed at low tide and/or under de-watered conditions, to the extent practicable.</td>
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<td>• If pile driving or installation of temporary sheet piles is necessary during construction or restoration activities outside of the main plant fenceline, such as for earthwork, foundations, or dewatering, then pile driving will be performed using a vibratory hammer to minimize the potential effects of noise and pressure-waves on fish.</td>
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<td>• NMFS personnel will be immediately notified of any observed fish mortality events associated with Master Plan activities.</td>
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<td>• Tidally restored ponds will contain channels that are adequate for the ingress and egress of fish with tidal circulation to avoid fish stranding.</td>
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<td>• Treated wood will not be used in structures that may come into contact with water.</td>
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<td>Mitigation Measure BIO-2d: Western Pond Turtle Measures</td>
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<tr>
<td>The following measures will be implemented to avoid and minimize impacts on western pond turtles in portions of the Master Plan area outside of the main plant fenceline, particularly in or near the Sunnyvale West Channel:</td>
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<td>• Impacts on aquatic habitat of the western pond turtle, such as the Sunnyvale West Channel, will be minimized to the extent feasible.</td>
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<td>• A qualified biologist shall conduct a survey for western pond turtles and their nests immediately (i.e., within 2 hours) prior to commencement of work along the Sunnyvale West Channel. If a western pond turtle is found in an area where it could be injured or killed by Master Plan improvement activities, the biologist will relocate the turtle to an appropriate site outside the construction disturbance area.</td>
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<td>• Following the initial survey, a construction crewmember who has been trained to identify western pond turtles by a qualified biologist shall conduct a survey of the work area along the Sunnyvale West Channel area each morning prior to the onset of construction activities. If a turtle is located, all work in the vicinity shall immediately cease, and a qualified biologist shall be contacted. Work within the area shall not resume until the turtle has been relocated or has moved on its own out of the construction disturbance area.</td>
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<td>• If an active western pond turtle nest is detected within the activity area, a 25 foot-buffer zone around the nest will be established and maintained during the nesting season (April 1 through August 31) until the young have left the nest or it is no longer active due to predation, as determined by a qualified biologist.</td>
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### Impact BIO-2 (cont.)

**Mitigation Measure BIO-2e: Burrowing Owl Measures**

The following measures will be implemented to avoid and minimize impacts on burrowing owls in the Master Plan area, particularly on the closed landfill and along the Sunnyvale West Channel but also including areas within the main plant fenceline that may support ground squirrel burrows:

- Preconstruction surveys for burrowing owls will be conducted by a qualified biologist prior to all construction activities that occur within 250 feet of potential burrowing owl habitat on the closed landfill or along the Sunnyvale West Channel, in conformance with CDFW protocols. This measure applies to construction activities inside of the main plant fenceline only where ground squirrel burrows are present or for those activities located within 250 feet of suitable burrowing owl habitat on the closed landfill or Sunnyvale West Channel. The final survey will occur no more than 2 days prior to the start of any ground-disturbing activity such as clearing and grubbing, excavation, or grading, or any similar activity within 250 feet of suitable habitat that could disturb nesting owls. If no burrowing owls are located during these surveys, no additional action would be warranted. However, if burrowing owls are located on or immediately adjacent to impact areas, the following measures would be implemented.

  - If burrowing owls are present during the nonbreeding season (generally 1 September to 31 January), the City/contractor would maintain a 150-foot buffer zone, within which no new Master Plan-related activity would occur, around the occupied burrow(s) if feasible. However, this buffer distance would not apply to existing operations and maintenance activities in the main plant. A reduced buffer distance is acceptable during the nonbreeding season as long as construction avoids direct impacts on the burrow(s) used by the owls. During the breeding season (generally 1 February to 31 August), a 250-foot buffer, within which no new Master Plan-related activity would be permissible, would be maintained between Master Plan activities and occupied burrows. Owls present at burrows on the site after 1 February would be assumed to be nesting on or adjacent to the site unless evidence indicates otherwise. This protected area would remain in effect until 31 August, or based upon monitoring evidence, until young owls are foraging independently or until the nest is no longer active.

  - In the unlikely event that an occupied burrowing owl burrow is within the construction footprint (e.g., on the bank of a levee), and the burrow cannot be avoided, the owl will be evicted from the burrow by a qualified biologist using one-way doors. The biologist will leave the one-way doors in place for at least 48 hours, checking them daily to ensure that they are functioning properly. If the biologist cannot be certain that the owl is outside the burrow (e.g., if the one-way doors were installed when the owl was inside the burrow and the owl cannot be detected outside later), then the burrow will be excavated by hand prior to being filled to ensure that no owl is trapped inside. Otherwise, the burrow will be backfilled after the owl has been evicted. No burrowing owls will be evicted from burrows during the nesting season unless evidence indicates that nesting is not actively occurring (e.g., because the owls have not yet begun nesting early in the season, or because young have already fledged late in the season).
### TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<th>Impacts</th>
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<tr>
<td>Biological Resources (cont.)</td>
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<tr>
<td>Impact BIO-2 (cont.)</td>
<td>Mitigation Measure BIO-2f: California Ridgway’s Rail and California Black Rail Measures</td>
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<td></td>
<td>The following measures will be implemented for activities outside of the main plant fenceline to avoid and minimize impacts on California Ridgway’s rails and California black rails, particularly in tidal marsh habitats associated with the Moffett Channel:</td>
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<td>• Impacts on tidal wetland habitat of these species will be minimized to the extent feasible. Tidal wetland habitat for these species occurs in the northern portions of the Master Plan area, in association with the Moffett Channel. Suitable tidal wetland habitat for these species is not present within the main plant fenceline.</td>
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<td>• To avoid causing the abandonment of an active nest, construction activities within 700 feet of vegetated tidal marsh providing suitable breeding habitat for Ridgway’s rails or black rails (i.e., the area along Moffett Channel where the marsh begins to widen just upstream from its confluence with Guadalupe Slough, or the large marsh area along Guadalupe Slough north of Pond 1) will be avoided during the breeding season from February 1 through August 31 unless protocol-level surveys are conducted to determine rail locations and territories the same year in which those construction activities occur. If breeding Ridgway’s rails or black rails are determined to be present, activities will not occur within 700 feet of areas in which Ridgway’s rails or black rails were heard calling during protocol-level surveys. If the intervening distance across a major slough channel (e.g., Moffett Channel or Guadalupe Slough) or across a substantial barrier between the locations of rail detections and any construction activity area is greater than 200 feet, then it may proceed at that location within the breeding season. Aside from continued use of recreational trails established prior to the start of the breeding season (which may continue), only routine inspection, maintenance, or monitoring activities that have little potential for effects on rails due to their short durations, distance from rail habitat, or low-magnitude effects may be performed during the breeding season in areas within or adjacent to rail breeding habitat. Otherwise, with USFWS and CDFW approval on a case-by-case basis, construction activities may take place after July 15 in a given area if the activity is thought to be minimally disturbing to breeding rails.</td>
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<td>• The extent of impacts on tidal marsh will be clearly demarcated in the field, and no impacts (including construction access) will occur outside those limits.</td>
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<td>• Silt fencing or similar material will be installed between all areas of earth-moving and marsh outside the impact area to prevent dirt and other materials from entering marsh areas that are not intended to be affected.</td>
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<td>• No animals can be brought to the project site to avoid harassing, killing, or injuring wildlife.</td>
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<td>• The project site will be maintained trash-free, and food refuse will be contained in secure bins and removed daily during construction and dredging.</td>
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<td>• Nighttime work near tidal marsh habitat will be avoided to the extent feasible. If nighttime work cannot be avoided, lighting will be directed to the work area and away from tidal marsh habitat.</td>
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TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<tbody>
<tr>
<td>Impact BIO-2 (cont.)</td>
<td><strong>Mitigation Measure BIO-2g: Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew Measures</strong></td>
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<td><strong>The following measures will be implemented for activities outside of the main plant fenceline to avoid and minimize impacts on the salt marsh harvest mouse and salt marsh wandering shrew, particularly in marsh habitat associated with the Moffett Channel:</strong></td>
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<td>• Impacts on pickleweed and wetland habitat that may support these species will be minimized to the extent feasible. Wetland habitat that may support these species occurs in the northern portion of the Master Plan area, in association with the Moffett Channel and the Cargill Channel. No suitable habitat for these species occurs within the main plant fenceline.</td>
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<td>• To avoid the loss of individual harvest mice or wandering shrews from any excavation, fill, or construction activities in suitable habitat, vegetation removal and fill in marsh habitats, including the Moffett Channel and the Cargill Channel, will be limited to the minimum amount necessary to implement the Master Plan improvements. Wherever feasible, sufficient pickleweed habitat will remain adjacent to the activity area to provide refugia for displaced individuals.</td>
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<td>• In areas where salt marsh harvest mice or wandering shrew habitat will be affected, vegetation and debris that could provide cover for mice will be removed using only hand tools at least three weeks prior to the commencement of construction activities. Vegetation removal will occur under the supervision of a qualified biologist. The vegetation will be removed on a progressive basis, such that the advancing front of vegetation removal moves toward vegetation that would not be disturbed. In some cases, temporary shelter consisting of dead vegetation may be positioned to provide escape routes to suitable habitat. A qualified biologist will monitor the vegetation removal and make specific recommendations with respect to the rate of vegetation removal (to ensure that any harvest mice or wandering shrews present are able to escape to cover that will not be affected), whether vegetation needs to remain in a certain area temporarily to facilitate dispersal of mice into habitat outside the impact area, and whether any berms are necessary to allow mice or shrews to disperse across wetted channels.</td>
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<td>• Following the hand-removal of vegetation in areas where these species may be affected, exclusion fencing will be erected as needed between construction areas and harvest mouse/wandering shrew habitat that is to remain unaffected to define and isolate protected habitat for these species. This fencing will consist of heavy plastic sheeting or metal material that cannot be climbed by harvest mice or wandering shrews, or similar Resource Agency-approved exclusion materials, buried at least 4 inches below the ground’s surface and with at least 1 foot (but no more than 4 feet) above the ground. All supports for the fencing will be placed on the inside of the work area. A 4-foot buffer will be maintained free of vegetation around the outside of the exclusion fencing. The fencing will be inspected daily during construction, and any necessary repairs will be made within 24 hours of when they are found. If any breaks in the fencing are found, a qualified biologist will inspect the work area for salt marsh harvest mice or wandering shrews. If any individual harvest mice are found within the impact footprint, they will be allowed to move on their own (although shrews may be relocated by a qualified biologist) to vegetated areas outside the impact footprint.</td>
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TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<td>Biological Resources (cont.)</td>
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<tr>
<td>Impact BIO-2 (cont.)</td>
<td>• During construction in areas where salt marsh harvest mice and wandering shrews may be affected, a qualified biologist will check underneath vehicles and equipment for these species before such equipment is moved during each day of construction, unless the equipment is surrounded by exclusion fencing. Based on current design concepts, the Master Plan is expected to affect approximately 1.5 acres of tidal coastal brackish marsh (in the Moffett Channel) and another 0.5 acre of non-tidal salt marsh (in the Cargill Channel) that could potentially support these species through raising (and as a result widening) an access road and construction of a new pipeline segment to the diurnal equalization basins. To compensate for these habitat impacts, the City will provide mitigation through a combination of (a) the purchase of credits in an approved conservation bank that provides habitat suitable for use by these species and/or (b) tidal marsh habitat restoration onsite or offshore. Owing to the relatively low quality of habitat provided by the wetlands to be affected by Master Plan activities, this mitigation will be provided at a minimum ratio of 1:1 (mitigation:impact) on an acreage basis. This mitigation can be provided using the same mitigation area as described in Mitigation Measure BIO-3b for wetlands as long as the habitat is suitable for the salt marsh harvest mouse and salt marsh wandering shrew and provides vegetated wetlands adequate to compensate for impacts on these species' habitats at a 1:1 ratio. Prior to construction, the City will purchase credits from an approved conservation bank and/or prepare a Habitat Mitigation and Monitoring Plan (HMMP) describing the proposed creation of mitigation habitats that will satisfy the mitigation requirements. Impacts on habitat of the salt marsh harvest mouse and salt marsh wandering shrew may not commence until the adequate credits in a conservation bank have been purchased and/or the City prepares the HMMP. The HMMP will be prepared by a qualified restoration ecologist and will include the following:</td>
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<td>• A summary of impacts on these species’ habitats and the proposed mitigation acreage</td>
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<td>• Goals of the restoration to achieve no net loss of habitat functions and values for these species</td>
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<td>• The location of the mitigation site and description of existing site conditions</td>
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<td>• Mitigation design:</td>
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<td></td>
<td>▪ Existing and proposed site hydrology, geomorphology, and geotechnical stability, if applicable</td>
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<td>▪ Grading plan if appropriate, including bank stabilization or other site stabilization features</td>
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<td>▪ Soil amendments and other site preparation elements as appropriate</td>
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<td></td>
<td>▪ Planting plan</td>
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<td>▪ Irrigation and maintenance plan</td>
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<td></td>
<td>▪ Construction schedule</td>
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### Summary of Impacts and Mitigation Measures for the Sunnyvale Water Pollution Control Plant Master Plan

<table>
<thead>
<tr>
<th>Biological Resources (cont.)</th>
<th>Mitigation Measures</th>
<th>Level of Significance after Mitigation</th>
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<tr>
<td>Impact BIO-2 (cont.)</td>
<td>Monitoring plan (including specific, objective final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.). Performance criteria will include demonstration of the presence of appropriate vegetation for these species within 10 years of mitigation implementation and presence of at least one of these two small mammal species within 10 years of the establishment of appropriate vegetated habitat.</td>
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<td>A contingency plan for mitigation elements that do not meet performance or final success criteria; this plan will include specific triggers for remediation if performance criteria are not being met.</td>
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**Mitigation Measure BIO-2h: Nesting Bird Measures**

The following measures will be implemented throughout the Master Plan area to minimize impacts on nesting San Francisco common yellowthroat, Alameda song sparrow, and other native bird species:

- Nesting deterrence can be implemented to minimize the potential for nesting birds to constrain project activities or to be adversely affected by those activities. The most effective nesting deterrence in non-developed portions of the main plant is vegetation removal to remove nesting substrate. Vegetation that is to be affected by the project should be removed during the nonbreeding season (i.e., September 1 through January 31) if feasible. If necessary, removal of nest-starts (incomplete nests that do not yet contain eggs or young) by qualified biologists may occur during the breeding season. Such nest-start removal may begin early in the breeding season (e.g., February) and continue regularly until vegetation can be removed and construction commences. Some species, such as barn swallows or black phoebes, may establish nests on buildings or other structures. To deter birds from nesting on structures, netting or other deterrence devices may be installed to preclude birds from constructing nests. Such nesting deterrence should be implemented under the supervision of qualified biologists in order to prevent death or injury of birds as a result of improperly installed deterrence devices, and such devices will require regular maintenance to ensure that they are functioning properly.

- Prior to commencement of new activities (i.e., activities that are not currently ongoing in any given area) during the breeding season (February 1 through August 31), preconstruction surveys will be conducted by a qualified biologist no more than 7 days prior to the initiation of new disturbance in any given area to ensure that no active nests of species protected by the Migratory Bird Treaty Act or California Fish and Game Code will be disturbed during Master Plan implementation. During this survey, the biologist will inspect all potential nesting habitats (e.g., trees, shrubs, buildings, and various substrates on the ground) in the project area for nests. This survey will include suitable nesting substrates both within and outside the main plant fenceline. Surveys will be conducted within search radii corresponding to disturbance-free buffer zones described below for raptors (300 feet) and non-raptors (100 feet), including offsite areas adjacent to the Master Plan area (where such areas are accessible).
### TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<td><strong>Biological Resources (cont.)</strong></td>
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| **Impact BIO-2 (cont.)** | - If an active nest is found, a qualified biologist will determine the extent of a disturbance-free buffer zone to be established around the nest until nesting has been completed. Disturbance-free buffer zones are typically 300 feet for raptors and 100 feet for non-raptors, although factors such as existing disturbance and vegetation or structures that screen construction activities from a nest will be considered in determining the appropriate buffer. Nests will be considered active until surveys conducted by a qualified ornithologist confirm nesting is complete. However, construction within these radii may proceed if, based on monitoring of the birds behavior, a qualified biologist determines that such activities are not likely to result in the abandonment of the nest. Per CDFW recommendations, monitoring will be conducted as follows:  
  - A qualified biologist will monitor activity at each nest for three days prior to the onset of construction activities to develop a baseline of the normal behavior of the birds attending the nest. If the behavior observed at the nest is consistent on Days 1 and 2 of monitoring, Day 3 of monitoring may be skipped.  
  - A qualified biologist will monitor activity at each nest for 8 hours on the first day that construction occurs within the standard buffer (e.g., within 100 feet of a non-raptor nest). If the biologist determines that the birds’ behavior is not adversely affected, Master Plan activities may continue. The biologist should continue to monitor the nests for 1 hour/day on any day when construction activities occur within the standard buffer around an active nest.  
  - If at any time the biologist determines that Master Plan activities within the standard buffer is adversely affecting the behavior of the birds such that the nest is in jeopardy of failing, construction activities should retreat to honor the standard buffer until the nest is no longer active (i.e., the young have fledged). | Less than Significant |
| **Impact BIO-3: The Master Plan could result in the loss of or damage to open water and wetland habitats that are considered Waters of the U.S. and/or State, a less-than-significant impact with mitigation.** | **Mitigation Measure BIO-3a: Avoidance of Open Water and Wetland Habitats** | |
| | - Detailed design of WPCP improvements for the Master Plan will avoid and minimize impacts on open water and wetland resources to the extent feasible.  
  - If open water and wetland habitats are present within 100 feet or less of the limits of disturbance in the Master Plan area, avoidance buffers shall be maintained between construction areas and the aquatic resources. These buffers should be at least 50 feet for general construction activities and 100 feet for grading, to the extent feasible. The avoidance buffers shall be designated as Environmentally Sensitive Areas and clearly identified in the field using orange fencing. No equipment, vehicles, or personnel are permitted within Environmentally Sensitive Areas. Environmentally Sensitive Areas shall be shown on Project plan sets. All Environmentally Sensitive Area fencing shall be maintained intact and in good condition throughout the duration of construction.  
  - Any temporarily affected aquatic and wetland habitats will be restored to preconstruction elevations and contours, and temporarily affected wetlands will be revegetated using native plant species appropriate for the salinity, elevation, and location of the affected area. | |
# TABLE S-2 (Continued)
## SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<td>Biological Resources (cont.)</td>
<td><strong>Mitigation Measure BIO-3b: Compensatory Mitigation for Aquatic and Wetland Habitats</strong>&lt;br&gt;The City shall obtain permits from the USACE, RWQCB, and CDFW as needed to obtain authorization to affect jurisdictional waters. In order to ensure that the proposed Master Plan results in no net loss of wetland and aquatic habitat functions and values, the City shall compensate for the permanent loss of jurisdictional wetland and aquatic habitats through a combination of on-site and/or off-site restoration/creation and protection and enhancement of wetland habitat. The size and location(s) of the area(s) to be restored/created will be determined based on appropriate mitigation ratios derived in consultation with USACE, RWQCB, and CDFW, but the amount of compensatory mitigation provided shall be at least 1:1 (i.e., at least equivalent to the acreage of jurisdictional wetlands and other waters permanently affected). Prior to construction, the City of Sunnyvale will purchase credits from a mitigation bank approved by the applicable resource agencies and/or prepare a Mitigation and Monitoring Plan describing the proposed creation of mitigation wetlands that will satisfy the mitigation requirements. Impacts on jurisdictional wetlands and other waters may not commence until the adequate credits in a mitigation bank have been purchased and/or the City of Sunnyvale prepares the Mitigation and Monitoring Plan. &lt;br&gt;The Mitigation and Monitoring Plan will be prepared by a qualified restoration ecologist and will include the following:&lt;br&gt;• A summary of wetland impacts and the proposed wetland creation mitigation&lt;br&gt;• Goals of the restoration to achieve no net loss of habitat functions and values&lt;br&gt;• The location of the mitigation site and description of existing site conditions&lt;br&gt;• Mitigation design:&lt;br&gt;  • Existing and proposed site hydrology, geomorphology, and geotechnical stability, if applicable&lt;br&gt;  • Grading plan if appropriate, including bank stabilization or other site stabilization features&lt;br&gt;  • Soil amendments and other site preparation elements as appropriate&lt;br&gt;• Planting plan&lt;br• Irrigation and maintenance plan&lt;br• Construction schedule&lt;br• Monitoring plan (including specific, objective final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.); Performance criteria will include the establishment of wetland vegetation on any vegetated wetland mitigation area within 5 years of mitigation implementation.&lt;br• A contingency plan for mitigation elements that do not meet performance or final success criteria within 5 years; this plan will include specific triggers for remediation if performance criteria are not being met.</td>
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<td>Impacts</td>
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<tr>
<td>Biological Resources (cont.)</td>
<td>Mitigation Measure BIO-4a: Avoidance and Preservation of Trees.</td>
<td>Less than Significant</td>
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Impact BIO-4: The Master Plan could result in the loss of or damage to protected trees, a less-than-significant impact with mitigation.

- Establish an area surrounding individual trees or groups of trees to be protected during construction as defined by a circle concentric with each tree with a radius 1-1/2 times the diameter of the tree canopy drip line. This Tree Protection Zone is established to protect the tree trunk, canopy and root system from damage during construction activities and to ensure the long-term survival of the protected trees. The Tree Protection Zone shall: (1) ensure that no structures or buildings, that might restrict sunlight relative to the existing condition, will be constructed in proximity to the trees; and (2) that no improvements are constructed on the ground around the tree within the Tree Protection Zone, thus ensuring that there is sufficient undisturbed native soil surrounding the tree to provide adequate moisture, soil nutrients and oxygen for healthy root growth.

- Protect tree root systems from damage caused by (a) runoff or spillage of noxious materials while mixing, placing, or storing construction materials and (b) ponding, eroding, or excessive wetting caused by dewatering operations through use of the following measures during excavation and grading:
  - Excavation: Do not trench inside tree protection zones. Hand excavate under or around tree roots to a depth of 3 feet. Do not cut main lateral tree roots or taproots. Protect exposed roots from drying out before placing permanent backfill.
  - Grading: Maintain existing grades within tree protection zones. Where existing grade is 2 inches or less below elevation of finish grade, backfill with topsoil or native site soil. Place fill soil in a single uncompacted layer and hand grade to required finish elevation.
  - Apply 6-inch average thickness of wood bark mulch inside tree protection zones. Keep mulch 6 inches from tree trunks.

- Provide 48-inch tall orange plastic construction fencing fastened to steel T-posts, minimum six (6) feet in length, using heavyweight plastic ratchet ties. Install fence along edges of tree protection zones before materials or equipment are brought on site and construction operations begin. Maintain fence in place until construction operations are complete and equipment has been removed from site.

- Provide temporary irrigation to all trees in protection zones using a temporary on-grade drip or bubbler irrigation system sufficient to wet the soil within tree protection zones to a depth of 30 inches per bi-weekly irrigation event.
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<tbody>
<tr>
<td><strong>Biological Resources (cont.)</strong></td>
<td>Mitigation Measure BIO-4b: Master Plan Compensation for Impacts on Protected Trees</td>
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<tr>
<td>Impact BIO-4 (cont.)</td>
<td>At the discretion of the Director of Community Development, the City will either replace any removed protected trees at a 1:1 ratio or pay an in-lieu fee into a fund.</td>
<td></td>
</tr>
<tr>
<td>Impact BIO-5: The Master Plan could result in interference with the movement of native birds, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact BIO-6: The Master Plan could result in impacts on nesting birds, a less-than-significant impact with mitigation.</td>
<td>Implement Mitigation Measure BIO-2h (Nesting Bird Measures).</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-BIO-1: Implementation of the Master Plan and WPF, in combination with other projects, would have a potentially significant contribution to cumulative impacts on biological resources, a significant and unavoidable impact.</td>
<td>No additional mitigation required.</td>
<td>Significant and Unavoidable</td>
</tr>
<tr>
<td><strong>Geology, Soils, Seismicity, and Mineral Resources</strong></td>
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</tr>
<tr>
<td>Impact GEO-1: The Master Plan could result in damage to or failure of structures and/or pipelines due to strong ground shaking or liquefaction during an earthquake, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact GEO-2: The project could result in exposure of structural components and the adjacent landfill to the effects of unstable soil conditions, a less-than-significant impact.</td>
<td></td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-GEO-1: Implementation of the Master Plan, in combination with other projects, could result in cumulative impacts related to geology, soils, seismicity, and mineral resources.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Hydrology</strong></td>
<td></td>
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<tr>
<td>Impact HYD-1: Stormwater runoff from project construction and operation could degrade water quality, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
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</table>
### Hydrology (cont.)

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<thead>
<tr>
<th>Impacts</th>
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<tbody>
<tr>
<td><strong>Impact HYD-2:</strong> The project would alter the existing drainage pattern in such a manner that could result in substantial erosion, siltation, or flooding, a less-than-significant impact with mitigation.</td>
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<table>
<thead>
<tr>
<th>Mitigation Measures</th>
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<tbody>
<tr>
<td><strong>Mitigation Measure HYD-2: Hydraulic Analysis of Levee Widening</strong></td>
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<tr>
<td>Prior to design of the diurnal equalization and emergency storage facilities, or any Master Plan improvement that would require widening of the existing levee and road between the main plant and Pond 1, the City or its contractor will conduct a hydraulic analysis assessing the potential secondary effects of levee widening on water surface elevation and channel scour in Moffett Channel. Recommendations of the hydraulic analysis will be incorporated into project design and contractor specifications such that any changes to water surface elevation or the channel do not adversely affect channel capacity. The project will acquire a No-Rise Certification to confirm that the selected alternative will not cause an increase in water surface elevations along the Moffett Channel. This finding will be confirmed and certified by a registered professional engineer.</td>
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<th>Level of Significance after Mitigation</th>
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<td>Less than Significant</td>
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| Impact HYD-3: Implementation of the Master Plan would place structures within a 100-year flood area, which could expose people or structures to a significant risk of loss, injury or death involving flooding, a less-than-significant impact with mitigation. |

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<tr>
<th>Mitigation Measures</th>
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<tbody>
<tr>
<td><strong>Mitigation Measure HYD-3a: Flood Hazard Assessment and Design For Diurnal Equalization Tanks, Pump Station, and Pipeline</strong></td>
</tr>
<tr>
<td>Prior to design of proposed WPCP improvements along Moffett Channel or within the oxidation ponds, the City will conduct a vulnerability analysis of project facilities to flooding, assess potential risks, and evaluate additional improvements that could reduce identified flood hazard risks. The evaluation will identify the flood safe elevation (FSE) as the sum of the (then) current base flood elevation (BFE) for the project area, the projected sea level rise during the project’s design service lifetime, and additional three to four feet of freeboard as determined necessary by a registered professional engineer. The risk assessment will address the construction and design of facilities below the FSE and the potential for significant loss, injury, or upset that could result from flooding, and identify feasible measures that could reduce flood hazard risks. Project design will incorporate the findings from the flood hazard assessment. Project design measures could include, but are not limited to, the following:</td>
</tr>
<tr>
<td>• Elevating the ground floor elevation of the diurnal equalization pump station above the FSE;</td>
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<tr>
<td>• Anchoring structures to prevent flotation, collapse and lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;</td>
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<tr>
<td>• Design of the extension of the primary effluent pipeline and associated support structures to minimize corrosion and ensure stability during occasional flooding;</td>
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<tr>
<td>The flood hazard assessment and selected design improvements for implementation shall be certified by a registered professional engineer to avoid a substantial risk of loss involving flooding.</td>
</tr>
</tbody>
</table>

| **Mitigation Measure HYD-3b: Restoration Plan for Ponds 1 and 2** |
| Prior to restoration of the oxidation ponds, the City shall develop a restoration plan for the oxidation ponds, to be implemented upon decommissioning. The plan must include: |
| • Hydraulic analysis of the flooding and erosion effects resulting from breaching the levees surrounding Ponds 1 and 2. |

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### TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<tr>
<td><strong>Hydrology (cont.)</strong></td>
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</table>
| **Impact HYD-3 (cont.)** | • An assessment of the effects of breaching on the floodplain surrounding the WPCP.  
• Regular inspection of the diurnal equalization and emergency storage facilities in coordination with a qualified engineer following breaching to look for evidence of erosion that appears to be associated with restoration of Ponds 1 and 2. If inspections identify excessive erosion, develop and implement a plan to protect the diurnal equalization and emergency storage facilities.  
• Restoration designs that reflect recommendations made by a qualified engineer. | |
| **Mitigation Measure HYD-3c: Flood Protection Prior to Levee Breaching** | The City of Sunnyvale shall not breach levees to restore Ponds 1 and 2 until adequate flood protection is provided for the landward uses that could be affected by such breaching, as determined in the assessment of effects to the surrounding floodplain included in the Restoration Plan for Ponds 1 and 2. | |
| **Impact HYD-4:** Construction activities at the WPCP would temporarily lower the groundwater table, a less-than-significant impact. | None required. | Less than Significant |
| **Impact C-HYD-1:** Implementation of the Master Plan, in combination with other projects, could result in cumulative impacts to hydrology. | No additional mitigation required. | Less than Significant |
| **Water Quality** | | |
| **Impact WQ-1:** The discharge resulting from the Master Plan improvements as part of the proposed Master Plan would comply with the applicable water quality regulations and not violate water quality objectives, a less-than-significant impact. | None required. | Less than Significant |
| **Impact WQ-2:** Master Plan implementation would increase the volume of discharge via the existing outfall in San Francisco Bay, a less-than-significant impact | None required. | Less than Significant |
| **Impact WQ-3:** The increased recycled water use under the Master Plan would be in compliance with Title 22 requirements that are protective of water quality and public health, a less-than-significant impact. | None required. | Less than Significant |
### TABLE S-2 (Continued)
**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN**

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<td><strong>Water Quality (cont.)</strong></td>
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</table>
| Impact WQ-4: Oxidation pond breaching and/or restoration could increase methylmercury production, a less-than-significant impact with mitigation. | Mitigation Measure WQ-4: Water Quality Evaluation and Control Plan for Oxidation Pond Breaching and Restoration
During design of oxidation pond breaching and/or restoration, the City, in coordination with other agencies directly involved in planning and implementing of restoration activities, shall require preparation of a water quality evaluation for the proposed levee breach and associated pond restoration activities. The water quality evaluation shall evaluate anticipated construction activities and anticipated changes to pond area and nearby hydrodynamics, and evaluate their potential to influence each of the water quality parameters discussed in this analysis: temperature, salinity, DO, metals, mercury, methyl mercury, phytoplankton blooms, and nuisance algae.
The water quality evaluation shall consider applicable water quality standards and goals defined in the Basin Plan, the Bay Conservation and Development Commission’s Bay Plan Policies on Water Quality, as applicable, and other applicable water quality standards. The water quality evaluation shall provide recommendations for the minimization of each category of potential water quality pollutants described above, sufficient to ensure that downstream beneficial uses would not be adversely affected, and that applicable water quality standards would not be exceeded. The City shall implement all recommendations identified in the water quality evaluation needed to preserve water quality and maintain consistency with the Basin Plan and other applicable water quality standards and requirements, and protect beneficial uses on site and downstream. The water quality evaluation shall also identify protocols and procedures for the deployment of long-term monitoring for temperature, salinity, dissolved oxygen, metals including mercury, methylmercury, phytoplankton blooms, and nuisance algae, and shall, in the event of exceedance of applicable standards established to protect beneficial use by the Regional Board, identify measures and actions as warranted to reduce pollutant emissions and protect beneficial uses. | Less than Significant |
| Impact C-WQ-1: Implementation of the Master Plan, in combination with other projects, could result in cumulative impacts to water quality. | No additional mitigation required. | Less than Significant |
| **Hazards and Hazardous Materials** | | |
| Impact HAZ-1: Project operation would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, a less-than-significant impact. | None required. | Less than Significant |
| Impact HAZ-2: Project construction activities could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, a less-than-significant impact with mitigation. | Mitigation Measure HAZ-2a: Hazardous Building Materials Abatement.
The City (or for WPF, District) shall ensure that, prior to demolition, the building is surveyed for hazardous building materials including, electrical equipment containing polychlorinated biphenyl (PCBs), fluorescent light ballasts containing PCBs or bis(2-ethylhexyl) phthalate (DEHP), and fluorescent light tubes containing mercury vapors. These materials shall be removed and properly disposed of prior to the start of demolition or renovation. Light ballasts that are proposed to be removed during renovation shall be evaluated for the presence of PCBs and in the case where the presence of PCBs in the light ballast cannot be verified, they shall be assumed to contain | Less than Significant |
### TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<tr>
<td><strong>Hazards and Hazardous Materials (cont.)</strong></td>
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<tr>
<td><strong>Impact HAZ-2 (cont.)</strong></td>
<td>PCBs, and handled and disposed of as such, according to applicable laws and regulations. Any other hazardous building materials identified either before or during demolition or renovation shall be abated according to federal, state, and local laws and regulations. <strong>Mitigation Measure HAZ-2b: Health and Safety Plan.</strong> For any elements involving ground disturbing activities, the City (or for WPF, District) or its contractor will prepare a Health and Safety Plan in accordance with federal OSHA regulations (29 CFR 1910.120) and Cal/OSHA regulations (8 CCR Title 8, Section 5192). The Plan will be based on all the proposed Master Plan improvements involving ground disturbance and include designated personnel responsible for implementation of the Health and Safety Plan. The City will require each contractor for each individual construction contract to implement the Plan. The Plan will include all required measures to protect construction workers and the general public potentially exposed to hazardous materials or wastes by including engineering controls, monitoring, and security measures to prevent dangerous levels of exposure and unauthorized entry to the construction area, and to reduce hazards outside of any construction area. If prescribed contaminant exposure levels are exceeded, personal protective equipment shall be required for workers in accordance with state and federal regulations. Compliance with the City’s Health and Safety Plan will not be construed as approval of the adequacy of the contractor’s health and safety professional’s qualifications or any safety measure taken in or near the construction site. The contractor will be solely and fully responsible for compliance with all laws, rules, and regulations applicable to health and safety during the performance of the construction work. <strong>Mitigation Measure HAZ-2c: Soil and Groundwater Management Plan.</strong> For any elements involving ground disturbing activities, the City (or for WPF, District) will require the construction contractor to implement a Soil and Groundwater Management Plan, subject to review by the City that specifies the method for handling and disposal of contaminated soil and groundwater prior to demolition, excavation, and construction activities. The plan will include all necessary procedures to ensure that any excavated materials and fluids from throughout the Master Plan area generated during construction are stored, managed, and disposed of in a manner that is protective of human health and in accordance with applicable laws and regulations. The plan will include the following information. • Step-by-step procedures for evaluation, handling, stockpiling, storage, testing, and disposal of excavated material, including criteria for reuse and offsite disposal. All excavated materials shall be inspected prior to initial stockpiling, and spoils that are visibly stained and/or have a noticeable odor shall be stockpiled separately to minimize the amount of material that may require special handling. • Procedures to be implemented if unknown subsurface conditions or contamination are encountered, such as previously unreported tanks, wells, or contaminated soils. • Detailed control measures for use and storage of hazardous materials to prevent the release of pollutants to the environment, and emergency procedures for the containment and cleanup of accidental releases of hazardous materials to minimize the impacts of any such release. These procedures shall also include reporting.</td>
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### TABLE S-2 (Continued)
**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN**

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<tr>
<td><strong>Hazard and Hazardous Materials (cont.)</strong></td>
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<tr>
<td>Impact HAZ-2 (cont.)</td>
<td>requirements in the event of a reportable spill or other emergency incident. At a minimum, the City or its contractor shall notify applicable agencies in accordance with guidance from the California Office of Emergency Services as well as the Santa Clara County Environmental Health Department. - Procedures for containment, handling and disposal of groundwater generated from construction dewatering, the method used to analyze groundwater for hazardous materials likely to be encountered at specific locations and the appropriate treatment and/or disposal methods.</td>
<td></td>
</tr>
<tr>
<td>Impact HAZ-3: Portions of the project could be located on sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment, a less-than-significant impact with mitigation.</td>
<td>Implement Mitigation Measures HAZ-2b (Health and Safety Plan) and HAZ-2c (Soil and Groundwater Management Plan).</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact HAZ-4: The Master Plan structures would be within two miles of Moffett Federal Airfield, but would pose no safety hazard for workers at the WPCP, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact HAZ-5: The project would not impair or interfere with an adopted emergency response plan or emergency evacuation plan but could interfere with emergency response provider access in the WPCP vicinity, a less-than-significant impact with mitigation.</td>
<td>Implement Mitigation Measure TR-1b (Implement a Temporary Traffic Control Plan).</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-HAZ-1: The project could result in cumulatively considerable impacts related to hazards and hazardous materials.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Public Services and Facilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact PS-1: The project would not result in substantial adverse physical impacts associated with the need for new or altered police and fire protection facilities in order to maintain acceptable service ratios, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
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**TABLE S-2 (Continued)**

**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN**

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<tbody>
<tr>
<td><strong>Public Services and Facilities (cont.)</strong></td>
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</tr>
<tr>
<td>Impact C-PS-1: Implementation of the Master Plan, combined with other projects in the area, could result in cumulative impacts on public services and facilities.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Utilities and Service Systems</strong></td>
<td></td>
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<tr>
<td>Impact UT-1: There would be sufficient permitted capacity to accommodate the project’s solid waste disposal needs, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact UT-2: The project would be in compliance with federal, state, and local statutes and regulations related to solid waste, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-UT-1: Implementation of the Master Plan, combined with other projects in the area, could result in cumulative impacts on utilities and service systems.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Cultural Resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact CUL-1: The project could result in a substantial adverse change in the significance of a historical resource, a less-than-significant impact with mitigation.</td>
<td>Mitigation Measure CUL-1. Assessment of Effects to Cargill Channel. Prior to implementation of the Diurnal Equalization and Emergency Storage Facilities project or other action that could affect the Cargill Channel, the City will retain a qualified historian or architectural historian to complete a specific assessment of effects of this action. If effects are found to be adverse, additional mitigation measures may be necessary, including supplemental Historic American Landscapes Survey documentation, as well as public interpretation efforts such as videotaping resources, a public outreach program, or signage at appropriate points near publically accessible viewsheds of Cargill Channel.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact CUL-2: The project could result in a substantial change in the significance of an archaeological resource, a less-than-significant impact with mitigation.</td>
<td>Mitigation Measure CUL-2: Unanticipated Discovery of Archaeological Resources. If prehistoric or historic-period archaeological resources are encountered, all construction activities within 100 feet will halt and the City of Sunnyvale will be notified. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include deposits of metal, glass, and/or ceramic refuse. A Secretary of the Interior-qualified archaeologist will inspect the findings within 24 hours of discovery. If it is determined that the project could damage a historical resource or a unique archaeological resource (as defined pursuant to the CEQA Guidelines), mitigation will be implemented in accordance with PRC Section 21083.2 and Section 15126.4 of the CEQA Guidelines, with a preference for preservation in place. Consistent with</td>
<td>Less than Significant</td>
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TABLE S-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN

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<tr>
<td><strong>Cultural Resources (cont.)</strong></td>
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<tr>
<td>Impact CUL-2 (cont.)</td>
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<tr>
<td>Section 15126.4(b)(3), this may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement. If avoidance is not feasible, a qualified archaeologist will prepare and implement a detailed treatment plan in consultation with City of Sunnyvale and, for prehistoric resources, the appropriate Native American representative. Treatment of unique archaeological resources will follow the applicable requirements of PRC Section 21083.2. Treatment for most resources would consist of (but would not be limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the project. The treatment plan will include provisions for analysis of data in a regional context, reporting of results within a timely manner, curation of artifacts and data at an approved facility, and dissemination of reports to local and state repositories, libraries, and interested professionals.</td>
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<tr>
<td>Impact CUL-3: The project could result in direct or indirect impacts on paleontological resources, a less-than-significant impact with mitigation.</td>
<td>Mitigation Measure CUL-3: Unanticipated Discovery of Paleontological Resources. If paleontological resources, such as fossilized bone, teeth, shell, tracks, trails, casts, molds, or impressions are discovered during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a qualified paleontologist can assess the nature and importance of the find and, if necessary, develop appropriate treatment measures in conformance with Society of Vertebrate Paleontology standards, and in consultation with the City of Sunnyvale (or, for the WPF, the District).</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact CUL-4: The project could result in disturbance of human remains, a less-than-significant impact with mitigation.</td>
<td>Mitigation Measure CUL-4: Unanticipated Discovery of Human Remains. In the event of discovery or recognition of any human remains during construction activities, such activities within 100 feet of the find will cease until the Santa Clara County Coroner has been contacted to determine that no investigation of the cause of death is required. The NAHC will be contacted within 24 hours if it is determined that the remains are Native American. The NAHC will then identify the person or persons it believes to be the most likely descendant from the deceased Native American, who in turn would make recommendations to the City of Sunnyvale (or, for the WPF, the District) for the appropriate means of treating the human remains and any grave goods.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-CUL-1: Implementation of the Master Plan, combined with other projects, could result in cumulative impacts on Cultural and Paleontological Resources.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Aesthetics</strong></td>
<td></td>
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<tr>
<td>Impact AES-1: The Master Plan would change the existing visual character of the site, a less-than-significant impact with mitigation.</td>
<td>Mitigation Measure AES-1: Levee Plantings and Visual Screening. The design of the access road and levee will include landscape plantings. Planting design will retain safety, structural integrity, and functionality of the access road and levee, and accessibility for maintenance, inspection, monitoring, and flood control. Design of the landscape plantings and vegetation management program will be coordinated with a civil engineer and landscape architect, along with the District and the City of Sunnyvale, to</td>
<td>Less than Significant</td>
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### TABLE S-2 (Continued)

**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN**

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<td><strong>Aesthetics (cont.)</strong></td>
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<tr>
<td>Impact AES-1 (cont.)</td>
<td>ensure that landscaping and maintenance practices chosen are ecologically compatible, feasible, and compatible with flood damage protection. The levee planting plans chosen for implementation will be certified by a registered professional engineer to ensure reliable operation and maintenance of the access road and levee and reviewed by a qualified biologist to ensure compatibility of the plants with the existing plant mosaic. The Master Plan will also include fencing around the proposed equalization tanks and pump station. The fencing will be of sufficient height to block views of these facilities (i.e., six to eight feet above grade) and include aesthetic treatment to make the structure less visually obtrusive and blend in with the surrounding background. Possible aesthetic treatment can include architectural features such as color application, surface texture and pattern treatment.</td>
<td></td>
</tr>
<tr>
<td>Impact AES-2: The Master Plan would not create a new source of light or glare, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-AES-1: Implementation of the Master Plan, combined with other projects, could result in cumulative impacts on aesthetic resources.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Energy Conservation</strong></td>
<td></td>
<td></td>
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<tr>
<td>Impact ENER-1: Construction and operation of the proposed Master Plan would not result in use of fuel or energy in a wasteful manner, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact ENER-2: Implementation of the proposed Master Plan would not conflict with applicable energy policies or standards, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-ENER-1: Implementation of the Master Plan, combined with other projects in the area, would not result in cumulative impacts to local and regional energy resources by resulting in wasteful, inefficient, and/or unnecessary consumption of energy.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
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<tr>
<td><strong>Growth Inducement Potential and Secondary Effect of Growth</strong></td>
<td></td>
<td>Significant and unavoidable for some secondary effects of growth.</td>
</tr>
<tr>
<td><strong>Impact GI-1:</strong> The project would support planned growth in the WPCP and District service areas that would result in secondary effects on the physical environment. Implementation of the project’s wastewater treatment capacity improvements could also support a degree of population and/or employment above that planned for in Sunnyvale’s adopted General Plan, a significant and unavoidable impact.</td>
<td><strong>Mitigation Measure GI-1: Update Projections</strong></td>
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<td></td>
<td>Prior to implementation of Stage 2 of the conventional activated sludge and Stage 2 of solids thickening and dewatering facilities and processes, Stage 2 of the MBR facilities and Stage 2 of WPF solids thickening and dewatering facilities, or construction of a fifth digester, the City will: (1) initiate a new investigation of flows and loads capacity requirements to ensure that these facilities are appropriately sized to accommodate projected capacity needs consistent with (then) adopted plans and policies; and (2) require that CEQA documents on development projects evaluate nitrogen deposition impacts on serpentine habitat and associated special-status species, and mitigate significant project-specific and cumulative impacts to less-than-significant levels. The analysis requirements and specific mitigation strategy(ies) will depend on the environmental setting at the time the Master Plan or WPF improvements are implemented, characteristics of the proposed development, and its relative contribution to the significant impact.</td>
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## TABLE S-3
### SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance after Mitigation</th>
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</thead>
<tbody>
<tr>
<td><strong>Land Use and Recreation</strong></td>
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<tr>
<td><strong>Impact WPF-LU-1:</strong> The WPF would be consistent with local plans and policies, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF-LU-2:</strong> The WPF would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact C-LU-1:</strong> Implementation of the WPF, in combination with other projects, could result in cumulative impacts related to land use, agricultural resources, and recreational resources.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
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<tr>
<td><strong>Transportation</strong></td>
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<tr>
<td><strong>Impact WPF-TR-1:</strong> The activities associated with the project would temporarily reduce roadway capacity and increase traffic delays on area roadways, which could conflict with applicable measures of effectiveness for the performance of the circulation system, a less-than-significant impact with mitigation.</td>
<td>Mitigation Measure WPF-TR-1: Implement a Temporary Traffic Control Plan. The District shall require the contractor(s) to prepare and implement a traffic control plan to reduce traffic impacts on the roadways at and near the work site, as well as to reduce potential traffic safety hazards and ensure adequate access for emergency responders. The District shall coordinate development and implementation of this plan with relevant County and City departments (e.g., Emergency Services, Fire, Police, Transportation), as appropriate. To the extent applicable, the traffic control plan shall conform to the Caltrans' California Manual on Uniform Traffic Control Devices, Part 6 (Temporary Traffic Control). The traffic control plan shall include, but not be limited to, the following elements:</td>
<td>Less than Significant</td>
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<tr>
<td>• Circulation and detour plans to minimize impacts on local road circulation during road and lane closures. Flaggers and/or signage shall be used to guide vehicles through and/or around the construction zone.</td>
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<td>• Identifying truck routes designated by Santa Clara County. Haul routes that minimize truck traffic on local roadways shall be utilized to the extent possible.</td>
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<td>• Controlling and monitoring construction vehicle movement through the enforcement of standard construction specifications by onsite inspectors.</td>
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<td>• Sufficient staging areas for trucks accessing construction zones to minimize disruption of access to adjacent public rights-of-way.</td>
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<td>• Scheduling truck trips outside the peak morning and evening commute hours to the extent possible.</td>
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<tr>
<td>• Limiting the duration of road and lane closures to the extent possible.</td>
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<tr>
<td>Impacts</td>
<td>Mitigation Measures</td>
<td>Level of Significance after Mitigation</td>
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<tr>
<td><strong>Transportation (cont.)</strong></td>
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</table>
| Impact WPF-TR-1 (cont.)               | • Maintaining pedestrian and bicycle access and circulation during project construction where safe to do so. If construction activities encroach on bicycle routes or multi-use paths, advance warning signs (e.g., “Bicyclists Allowed Use of Full Lane” and/or “Share the Road”) shall be posted that indicate the presence of such users.  
• Identifying detours for bicycles and pedestrians, where applicable, in all areas affected by project construction.  
• Implementing roadside safety protocols. Advance “Road Work Ahead” warning and speed control signs (including those informing drivers of State legislated double fines for speed infractions in a construction zone) shall be posted to reduce speeds and provide safe traffic flow through the work zone.  
• Coordinating construction with administrators of police and fire stations (including all fire protection agencies), and recreational facility managers. Operators shall be notified in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures, where applicable.  
• Storing all equipment and materials in designated contractor staging areas on or adjacent to the worksite, such that traffic obstruction is minimized.  
• Repairing and restoring affected roadway rights-of way to their original condition after construction is completed. |                                                                                      |
| Impact WPF-TR-2: The project would increase traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways due to roadway design features, incompatible uses, or project-related vehicle trips, a less-than-significant impact with mitigation. | Implement Mitigation Measure WPF-TR-1 (Implement a Temporary Traffic Control Plan). | Less than Significant                  |
| Impact WPF-TR-3: The project could result in inadequate emergency access, a less-than-significant impact with mitigation. | Implement Mitigation Measure WPF-TR-1 (Implement a Temporary Traffic Control Plan). | Less than Significant                  |
| Impact WPF-TR-4: The project would not conflict with adopted policies, plans, and programs supporting alternative transportation, a less-than-significant impact. | None required. | Less than Significant                  |
| Impact C-TR-1: Implementation of the Master Plan and WPF, in combination with other projects, could result in cumulative impacts related to transportation, a less-than-significant impact with mitigation. | Mitigation Measure C-TR-1: Implement Coordinated Transportation Management Plan. | Less than Significant                  |
### TABLE S-3 (Continued)
### SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

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<tr>
<td><strong>Transportation (cont.)</strong></td>
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</table>
| Impact C-TR-1 (cont.) | | Projects within the vicinity of the Master Plan or the WPF in the region. The transportation management plan shall include, but not be limited to, the following requirements:  
- Coordination of individual traffic control plans for the Master Plan or WPF with nearby projects.  
- Coordination between the contractor and other project contractors in developing circulation and detour plans that include safety features (e.g., signage and flaggers). The circulation and detour plans shall address:  
  - Full and partial roadways closures  
  - Circulation and detour plans to include the use of signage and flagging to guide vehicles through and/or around the construction zone, as well as any temporary traffic control devices  
  - Bicycle/Pedestrian detour plans, where applicable  
  - Parking along public roadways  
  - Haul routes for construction trucks and staging areas for instances when multiple trucks arrive at the work sites  
Protocols for updating the transportation management plan to account for delays or changes in the schedules of individual projects. | |

### Noise

<table>
<thead>
<tr>
<th>Impact WPF-NOI-1: Demolition and construction associated with the WPF would result in a temporary increase in ambient noise levels in the project vicinity, a significant impact.</th>
<th>Mitigation Measure WPF-NOI-1a: Develop and Implement Construction Noise Logistics Plan</th>
<th>Significant and Unavoidable</th>
</tr>
</thead>
</table>
| For any WPF improvements involving construction activities at, or truck trips to or from, the WPCP between the hours of 6:00 p.m. and 7:00 a.m., the District will incorporate into the contract specifications required compliance with a Construction Noise Logistics Plan developed by the District or its contractor, which will specify hours of construction, identify noise and vibration minimization measures, require posting or notification of construction schedules and hours, and identify a designated noise disturbance coordinator who shall respond to noise complaints. The Plan shall include measures such as, but not limited to the following:  
- Consistent with Section 16.08.030 of the Sunnyvale Municipal Code, all noise generating construction activities at the project site shall be limited to the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday and between 8:00 a.m. and 5:00 p.m. on Saturdays as much as possible. There shall be no construction activity at the project site on Sundays and national holidays when city offices are closed. Any critical construction activities that will need to take place outside the hours stated above shall be completed as expeditiously as possible to reduce the duration of the impact. No extreme noise generating activities at the project site shall take place outside the hours listed above. | |
### TABLE S-3 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

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<td>Noise (cont.)</td>
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<tr>
<td>Impact WPF-NOI-1 (cont.)</td>
<td>• Any onsite construction activities that will need to take place outside the above mentioned hours will need prior approval from the City.</td>
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<td></td>
<td>• Signs shall be posted at the construction site that include construction days and hours, a day and evening contact number for the job site, and a day and evening contact number for the District in the event of problems.</td>
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<td></td>
<td>• All construction vehicles and equipment, fixed and mobile, shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds, wherever feasible).</td>
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<td>• Construction staging areas shall be located as far as practicable from existing recreational uses so as to cause minimal disruption to these activities.</td>
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<td></td>
<td>• Construction traffic to and from the project site shall be routed via designated truck routes that use freeways to the extent possible. Trucks shall not traverse through or adjacent to any residential areas, including along Lawrence Expressway, between the hours of 6:00 p.m. and 7:00 a.m. Preferred access to the site shall be from SR-237 through Caribbean Drive or North Mathilda Avenue.</td>
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<td>• Prohibit unnecessary idling of internal combustion engines.</td>
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<td>Prior to commencement of construction, as part of the subsequent project level CEQA analysis, a Noise and Vibration Reduction Plan shall be developed that includes, but is not limited to the following components:</td>
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<td>• Construction activities shall comply with the hours and standards specified by the applicable local noise ordinance(s).</td>
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<td></td>
<td>• All construction equipment shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds, wherever feasible) to meet relevant noise limitations.</td>
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<td></td>
<td>• Maximize physical separation, as far as practicable, between noise sources (construction equipment) and noise receptors. Separation may be achieved by providing enclosures for stationary items of equipment and noise barriers around noisy areas at the project sites and by locating stationary equipment to minimize noise impacts on the community.</td>
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**TABLE S-3 (Continued)**

**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES**

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<td>Noise (cont.)</td>
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<tr>
<td>Impact WPF-NOI-1 (cont.)</td>
<td>• To prevent cosmetic or structural damage to adjacent or nearby structures, the District will incorporate into contract specifications restrictions on construction for wells or pipelines whereby surface vibration will be limited to no more than 0.50 in/sec PPV, measured at the nearest reinforced-concrete, steel, or timber (no plaster) buildings and no more than 0.20 in/sec PPV, measured at the nearest non-engineered timber and/or masonry buildings. A noise disturbance coordinator shall be assigned who shall respond to any noise complaints from the community.</td>
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<tr>
<td></td>
<td>• Signs shall be posted at the construction site that include construction days and hours, a day and evening contact number for the job site, and a day and evening contact number for the local jurisdiction in the event of problems.</td>
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<td></td>
<td>• Utilize construction noise barriers such as paneled noise shields, movable barriers, or enclosures adjacent to or around noisy equipment associated with construction activities in the immediate vicinity (i.e., within 200 feet) of sensitive receptors. Noise control shields shall be made featuring a solid panel and a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.</td>
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<td></td>
<td>• Prohibit unnecessary idling of internal combustion engines.</td>
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</table>

All components of the Noise Reduction Plan shall be incorporated into the design of or contract specifications for the WPF pipelines and injection wells.

**Mitigation Measure WPF-NOI-1c: Nighttime Noise and Nuisance Reduction Plan.**

In the event that construction activity is determined to be necessary within 1,000 feet of sensitive receptors outside the hours of construction allowed for in the applicable local noise ordinance where construction would take place, the District shall require the contractor to develop a Nighttime Noise and Nuisance Reduction Plan. The plan shall include a set of site-specific noise attenuation measures that apply state-of-the-art noise reduction technology to ensure that nighttime construction noise levels and associated nuisances are reduced to the extent feasible. All noise attenuation measures shall be incorporated into the design of or contract specifications for the WPF pipelines and injection wells. If the local noise ordinance does not contain construction hour restrictions, this mitigation shall apply to construction activities taking place between the hours of 10 pm and 7 am. The attenuation measures included in the Plan shall include, but not be limited to, the control strategies and methods for implementation that are listed below. If any of the following strategies are determined by the District to not be feasible, an explanation as to why the specific strategy is not feasible shall be included in the Nighttime Noise and Nuisance Reduction Plan.

- Plan construction activities to minimize the amount of construction outside ordinance construction hours or outside the hours of 7 am to 10 pm, where the noise ordinance does not include construction hours.
- Install temporary noise barriers, such as shields and blankets, immediately adjacent to all stationary noise sources operating during evening and nighttime hours (e.g., auger rigs, generators).
### TABLE S-3 (Continued)
### SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

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<td><strong>Noise (cont.)</strong></td>
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</table>
| Impact WPF-NOI-1 (cont.) | • Install temporary noise barriers that block the line of sight between evening construction activities and the closest residences within 1,000 feet.  
• Publish and distribute to the potentially affected community within 1,000 feet of pending evening construction activities, a telephone number, which shall be attended during the evening construction working hours, for use by the public to register complaints. All complaints shall be logged noting date, time, complainants’ name, nature of complaint, and any corrective action taken.  
• If other means of reducing the nuisance associated with evening construction noise is infeasible, offer temporary relocation of residents within 200 feet of evening and nighttime construction activities. | |
| Impact WPF-NOI-2: Construction and operation of the WPF could expose persons to excessive groundborne noise or vibration, a less-than-significant impact with mitigation. | Implement Mitigation Measures WPF-NOI-1a (Construction Noise Logistics Plan), WPF-NOI-1b (Noise and Vibration Reduction Plan for Construction of Pipelines and Injection Wells) and WPF-NOI-1c (Nighttime Noise and Nuisance Reduction Plan). | Less than Significant |
| Impact WPF-NOI-3: Operation of the WPF facilities could result in a permanent increase in noise levels above existing ambient noise levels, a less-than-significant impact with mitigation. | Mitigation Measure WPF-NOI-3: Injection Well Siting and Design. Pumps and engines at the injection well locations shall be sited and designed such that land use compatibility standards of the applicable jurisdictions are met. During siting of injection wells, the District shall determine the potential increase in DNL generated by the injection wells. Siting and design measures to achieve the land use compatibility standards include:  
• Siting wells where the increase in Ldn at the nearest sensitive receptors would be within the new development compatibility standards in the general plans of the host jurisdictions.  
• Enclosing the injection wells and any associated equipment within buildings.  
• Designing injection well enclosures such that openings are directed away from sensitive receptors. | Less than Significant |
| Impact C-NOI-1: Implementation of the WPF, in combination with other projects, could result in cumulative impacts related to noise. | No additional mitigation required. | Less than Significant |
| **Air Quality** | | |
| Impact WPF-AQ-1: Implementation of the WPF would generate emissions that would conflict with the 2010 Clean Air Plan, a significant and unavoidable impact. | Implement Mitigation Measures WPF-AQ-2a (Implement BAAQMD Basic Construction Mitigation Measures) and WPF-AQ-2b (Implement BAAQMD Additional Construction Mitigation Measures). | Significant and Unavoidable |
| Impact WPF-AQ-2: Construction activities associated with the WPF would generate emissions that could contribute to air quality violations, a significant and unavoidable impact. | Mitigation Measure WPF-AQ-2a: Implement BAAQMD Basic Construction Mitigation Measures  
The District shall implement the following applicable BAAQMD Basic Construction Mitigation Measures to reduce emissions of fugitive dust and equipment exhaust: | Significant and Unavoidable |
### TABLE S-3 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

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<th>Impacts</th>
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<td><strong>Air Quality (cont.)</strong></td>
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<tr>
<td><strong>Impact WPF-AQ-2</strong>: (cont.)</td>
<td>• All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. &lt;br&gt;• All haul trucks transporting soil, sand, or other loose material offsite shall be covered. &lt;br&gt;• All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. &lt;br&gt;• All vehicle speeds on unpaved roads shall be limited to 15 mph. &lt;br&gt;• All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. &lt;br&gt;• Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. &lt;br&gt;• All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified visible emissions evaluator. &lt;br&gt;• Post a publicly visible sign with the telephone number and person to contact at the District regarding dust complaints. This person shall respond and take corrective action within 48 hours.</td>
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<tr>
<td><strong>Mitigation Measure WPF-AQ-2b: Implement BAAQMD Additional Construction Mitigation Measures</strong></td>
<td>The District shall implement the following applicable BAAQMD Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Thresholds to further reduce emissions of fugitive dust and exhaust: &lt;br&gt;• All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe. &lt;br&gt;• All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. &lt;br&gt;• Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity. &lt;br&gt;• Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. &lt;br&gt;• The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.</td>
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*Sunnyvale Water Pollution Control Plant Master Plan*<br>*Draft EIR*<br>*February 2016*
### TABLE S-3 (Continued)
**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES**

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<td><strong>Air Quality (cont.)</strong></td>
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</table>
| **Impact WPF-AQ-2: (cont.)**                                            | • All trucks and equipment, including their tires, shall be washed off prior to leaving the site.  
  • Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.  
  • Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.  
  • Minimizing the idling time of diesel powered construction equipment to two minutes.  
  • The District shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NOx reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of newer model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.  
  • Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM.  
  • Requiring all contractors use equipment that meets CARB’s most recent certification standard for off-road heavy duty diesel engines.                                                                                                                                                                                                                       |                                                              |
| **Impact WPF-AQ-3: Operational activities associated with the WPF would generate emissions that could contribute to air quality violations, a less-than-significant impact.** | None required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Less than Significant                                         |
| **Impact WPF-AQ-4: Construction and operation of the proposed WPF would expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions, a less-than-significant impact.** | None required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Less than Significant                                         |
| **Impact WPF-AQ-5: Implementation of the WPF would create odors that could affect nearby sensitive receptors, a less-than-significant impact.** | None required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Less than Significant                                         |
| **Impact C-AQ-1: Implementation of the WPF would have a considerable contribution to cumulative air quality impacts in the region, a significant and unavoidable impact.** | No additional mitigation required.                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Significant and Unavoidable                                  |
### Greenhouse Gas Emissions

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<tbody>
<tr>
<td>Impact WPF-GHG-1: Implementation of the WPF would not conflict with the Sunnyvale Climate Action Plan, or the GHG reduction goals set forth AB 32, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
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<tr>
<td>Impact WPF-GHG-2: Implementation of the WPF would generate greenhouse gas emissions, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-GHG-1: Implementation of the WPF, in combination with other projects, could result in cumulative impacts on GHG emissions.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
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</table>

### Biological Resources

**Impact WPF-BIO-1:** The WPF could result in the loss of or damage to special-status plants, a less-than-significant impact with mitigation.

**Mitigation Measure WPF-BIO-1a: Reduce Impacts on Congdon’s Tarplant**

- Within 2 years prior to initial ground disturbance, the District will retain a qualified biologist, or require the contractor to retain a qualified biologist, to conduct protocol-level surveys for Congdon’s tarplant in the WPF area. These surveys will be conducted in accordance with the protocols established by the CDFW and CNPS, and shall coincide with the bloom period for the species (May through November).
- If Congdon’s tarplant is present in the WPF area, the District contractor will avoid impacts on individuals of this species to the extent feasible during implementation of the WPF.
- If Congdon’s tarplant is present near the limits of disturbance, the District contractor will maintain a buffer free from construction-related activities around the tarplant occurrence; this buffer will be at least 50 feet if feasible, but large enough to avoid indirect impacts such as dust mobilization and alteration of hydrology. The District contractor shall demarcate the buffer in the field with orange fencing. No equipment, vehicles, or personnel shall be permitted within the buffer area during construction.
- If 15 percent or more of the known population of Congdon’s tarplant within five miles of the WPF area at the time of impact would be affected by the project, the District will provide compensatory mitigation. To compensate for loss of individual Congdon’s tarplants, off-site habitat either occupied by the species or suitable for restoration to support the species and revegetated with this species (such as Sunnyvale Baylands Park) shall be preserved and managed in perpetuity at a minimum 1:1 mitigation ratio (at least one plant preserved for each plant affected). Seeds from the affected population shall be collected and used to seed the mitigation area.

| Level of Significance after Mitigation | Less than Significant |
TABLE S-3 (Continued)

SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

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<td>Biological Resources (cont.)</td>
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Impact WPF-BIO-1 (cont.)  

Mitigation Measure WPF-BIO-1b: Prevent the Introduction and Spread of Non-native, Invasive Species

- The District will retain a qualified biologist, or require the contractor to retain a qualified biologist, to develop an Invasive Species Management Plan to reduce the presence and spread of non-native, invasive plant species in the WPF area. The Invasive Species Management Plan shall be developed prior to any grading activities and prior to importing any fill material to the project areas. The overarching goal of this mitigation is to halt the further expansion of existing invasive species and introduction of new invasives into sensitive habitats in WPF areas. The Invasive Species Management Plan shall include, but not be limited to, the following:

  - Prior to construction, the extent and locations of invasive species occurrences will be mapped within all areas proposed to be graded, including access roads and staging areas, and within all sensitive habitats (e.g., wetlands) across the Project areas.

  - Areas identified to have weed infestations shall be treated prior to ground disturbance according to weed control methods detailed below:

    - Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods approved for application. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the City of Newark, and implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 72 hours of a scheduled rain event. Where manual and/or mechanical methods are used, disposal of the plant debris will take place at an appropriate off-site location. The timing of the weed control treatment shall be determined for each plant species with the goal of controlling populations before they start producing seeds and/or encroach into adjacent areas from rhizomatous shoots. Consultation with a qualified wildlife biologist and plant ecologist shall be required prior to weed control treatments in sensitive habitats with the intent of avoiding any adverse impacts on special-status species in the area.

    - Surveying and monitoring for weed infestations shall occur over the course of grading operations. Treatment of all identified weed populations shall occur at a minimum of once annually.

    - Once grading ceases, invasive plant populations within all sensitive habitats (such as wetlands) that are not impacted, but that are within 200 feet of grading/construction areas, shall be mapped and the aerial extent and location of invasive populations documented. This shall occur on an annual basis for a minimum of 3 years following grading operations.

  - If, in any monitoring year, the size of existing populations within sensitive habitats expands by 20 percent or more in terms of surface area in comparison to the population size documented prior to construction, the weed control measures described above shall be implemented (inter-annual variation due to climate differences may account for as much as 10 percent of change).
### TABLE S-3 (Continued)

**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES**

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<td><strong>Biological Resources (cont.)</strong></td>
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| **Impact WPF-BIO-1 (cont.)** | − During construction activities, all seeds and straw materials used on site shall be weed-free rice straw, and all gravel and fill material shall be certified weed free.  
− During construction activities, vehicles and all equipment shall be washed (including wheels, undercarriages, and bumpers) before entering the Project areas. Vehicles shall be cleaned at existing construction yards or legally operating car washes. The Project proponent shall document all vehicles have been washed prior to commencing work. In addition, tools such as chainsaws, hand clippers, pruners, etc., shall be washed before entering the work areas. | | |
| **Impact WPF-BIO-2:** The WPF could result in the loss of or damage to special-status wildlife species, a less-than-significant impact with mitigation. | **Mitigation Measure WPF-BIO-2a: Worker Environmental Awareness Training.**  
The District will retain, or require the contractor to retain, a qualified biologist to conduct mandatory contractor/worker environmental awareness training for all construction personnel working on WPF activities outside of the main plant. The awareness training will be provided to all construction personnel to brief them on the potential for special-status species to occur on the site, the need to avoid effects to special-status species and their habitats, and all WPF mitigation measures pertaining to biological resources and water quality. If new construction personnel are added, the contractor will ensure that the personnel receive the mandatory training before starting work. A representative will be appointed during the employee education program to be the contact for any employee or contractor who might inadvertently kill or injure a special-status species or who finds a dead, injured, or entrapped individual. The representative’s name and telephone number will be provided to the District prior to the initiation of construction activities outside of the main plant.  
**Mitigation Measure WPF-BIO-2b: Burrowing Owl Measures.**  
The following measures will be implemented to avoid and minimize impacts on burrowing owls in the WPF area:  
• Preconstruction surveys for burrowing owls will be conducted by a qualified biologist prior to all construction activities that occur within 250 feet of potential burrowing owl habitat, in conformance with CDFW protocols. Suitable habitat for burrowing owls is present within 250 feet of the WPF area on the closed landfill to the south of the main plant and along the Sunnyvale West Channel, and additional suitable habitat may also be present within 250 feet of other pipeline construction areas. The final survey will occur no more than 2 days prior to the start of any ground-disturbing activity such as clearing and grubbing, excavation, or grading, or any similar activity within 250 feet of suitable habitat that could disturb nesting owls. If no burrowing owls are located during these surveys, no additional action would be warranted. However, if burrowing owls are located on or immediately adjacent to impact areas, the following measures would be implemented.  
• If burrowing owls are present during the nonbreeding season (generally 1 September to 31 January), the District/contractor would maintain a 150-foot buffer zone, within which no new WPF-related activity would occur, around the occupied burrow(s) if feasible. A reduced buffer is acceptable during the nonbreeding season. | Less than Significant |
### TABLE S-3 (Continued)

**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES**

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| **Impact WPF-BIO-2 (cont.)**                 | season as long as construction avoids direct impacts on the burrow(s) used by the owls. During the breeding season (generally 1 February to 31 August), a 250-foot buffer, within which no new WPF-related activity would be permissible, would be maintained between WPF activities and occupied burrows. Owls present at burrows on the site after 1 February would be assumed to be nesting on or adjacent to the site unless evidence indicates otherwise. This protected area would remain in effect until 31 August, or based upon monitoring evidence, until young owls are foraging independently or until the nest is no longer active.  

In the unlikely event that an occupied burrowing owl burrow is within the construction footprint (e.g., on the bank of a levee), and the burrow cannot be avoided, the owl will be evicted from the burrow by a qualified biologist using one-way doors. The biologist will leave the one-way doors in place for at least 48 hours, checking them daily to ensure that they are functioning properly. If the biologist cannot be certain that the owl is outside the burrow (e.g., if the one-way doors were installed when the owl was inside the burrow and the owl cannot be detected outside later), then the burrow will be excavated by hand prior to being filled to ensure that no owl is trapped inside. Otherwise, the burrow will be backfilled after the owl has been evicted. No burrowing owls will be evicted from burrows during the nesting season unless evidence indicates that nesting is not actively occurring (e.g., because the owls have not yet begun nesting early in the season, or because young have already fledged late in the season).  

**Mitigation Measure WPF-BIO-2c: Western Pond Turtle Measures.**

The following measures will be implemented to avoid and minimize impacts on western pond turtles in the WPF area:

- Impacts on aquatic habitat of the western pond turtle will be minimized to the extent feasible. Aquatic habitat for this species is present in the Sunnyvale West Channel and may be present in or adjacent to other pipeline construction areas.

- A qualified biologist shall conduct a survey for western pond turtles and their nests immediately (i.e., within 2 hours) prior to commencement of work along the Sunnyvale West Channel. If a western pond turtle is found in an area where it could be injured or killed by WPF improvement activities, the biologist will relocate the turtle to an appropriate site outside the construction area.

- Following the initial survey, a construction crewmember who has been trained to identify western pond turtles by a qualified biologist shall conduct a survey of the work area along the Sunnyvale West Channel area each morning prior to the onset of construction activities. If a turtle is located, all work in the vicinity shall immediately cease, and a qualified biologist shall be contacted. Work within the area shall not resume until the turtle has been relocated or has moved on its own out of the construction area.

- If an active western pond turtle nest is detected within the activity area, a 25 foot-buffer zone around the nest will be established and maintained during the nesting season (April 1 through August 31) until the young have left the nest or it is no longer active due to predation, as determined by a qualified biologist. | Level of Significance after Mitigation

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**Impacts** | **Mitigation Measures** | **Level of Significance after Mitigation** |
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Biological Resources (cont.) | season as long as construction avoids direct impacts on the burrow(s) used by the owls. During the breeding season (generally 1 February to 31 August), a 250-foot buffer, within which no new WPF-related activity would be permissible, would be maintained between WPF activities and occupied burrows. Owls present at burrows on the site after 1 February would be assumed to be nesting on or adjacent to the site unless evidence indicates otherwise. This protected area would remain in effect until 31 August, or based upon monitoring evidence, until young owls are foraging independently or until the nest is no longer active. | Level of Significance after Mitigation |
Impact WPF-BIO-2 (cont.) | season as long as construction avoids direct impacts on the burrow(s) used by the owls. During the breeding season (generally 1 February to 31 August), a 250-foot buffer, within which no new WPF-related activity would be permissible, would be maintained between WPF activities and occupied burrows. Owls present at burrows on the site after 1 February would be assumed to be nesting on or adjacent to the site unless evidence indicates otherwise. This protected area would remain in effect until 31 August, or based upon monitoring evidence, until young owls are foraging independently or until the nest is no longer active. | Level of Significance after Mitigation |
### TABLE S-3 (Continued)
**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES**

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<td>Biological Resources (cont.)</td>
<td>Mitigation Measure WPF-BIO-2d: Nesting Bird Measures. The following measures will be implemented to minimize impacts on nesting San Francisco common yellowthroat, Alameda song sparrow, and other native bird species:</td>
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- Nesting deterrence can be implemented to minimize the potential for nesting birds to constrain project activities or to be adversely affected by those activities. The most effective nesting deterrence in non-developed portions of the main plant is vegetation removal to remove nesting substrate. Vegetation that is to be affected by the project should be removed during the nonbreeding season (i.e., September 1 through January 31) if feasible. If necessary, removal of nest-starts (incomplete nests that do not yet contain eggs or young) by qualified biologists may occur during the breeding season. Such nest-start removal may begin early in the breeding season (e.g., February) and continue regularly until vegetation can be removed and construction commences. Some species, such as barn swallows or black phoebes, may establish nests on buildings or other structures. To deter birds from nesting on structures, netting or other deterrence devices may be installed to preclude birds from constructing nests. Such nesting deterrence should be implemented under the supervision of qualified biologists in order to prevent death or injury of birds as a result of improperly installed deterrence devices, and such devices will require regular maintenance to ensure that they are functioning properly.

- Prior to commencement of new activities (i.e., activities that are not currently ongoing in any given area) during the breeding season (February 1 through August 31), preconstruction surveys will be conducted by a qualified biologist no more than 7 days prior to the initiation of new disturbance in any given area to ensure that no active nests of species protected by the Migratory Bird Treaty Act or California Fish and Game Code will be disturbed during Master Plan implementation. During this survey, the biologist will inspect all potential nesting habitats (e.g., trees, shrubs, buildings, and various substrates on the ground) in the Project area for nests. Surveys will be conducted within search radii corresponding to disturbance-free buffer zones described below for raptors (300 feet) and non-raptors (100 feet), including in off-site areas adjacent to the Master Plan area (where such areas are accessible).

- If an active nest is found, a qualified biologist will determine the extent of a disturbance-free buffer zone to be established around the nest until nesting has been completed. Disturbance-free buffer zones are typically 300 feet for raptors and 100 feet for non-raptors, although factors such as existing disturbance and vegetation or structures that screen construction activities from a nest will be considered in determining the appropriate buffer. Nests will be considered active until surveys conducted by a qualified ornithologist confirm nesting is complete. However, construction within these radii may proceed if, based on monitoring of the birds behavior, a qualified biologist determines that such activities are not likely to result in the abandonment of the nest. Per CDFW recommendations, monitoring will be conducted as follows:
  - A qualified biologist will monitor activity at each nest for three days prior to the onset of construction activities to develop a baseline of the normal behavior of the birds attending the nest. If the behavior observed at the nest is consistent on Days 1 and 2 of monitoring, Day 3 of monitoring may be skipped.
TABLE S-3 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

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<td>Impact WPF-BIO-2 (cont.)</td>
<td>− A qualified biologist will monitor activity at each nest for 8 hours on the first day that construction occurs within the standard buffer (e.g., within 100 feet of a non-raptor nest). If the biologist determines that the birds’ behavior is not adversely affected, WPF activities may continue. The biologist should continue to monitor the nests for 1 hour/day on any day when construction activities occur within the standard buffer around an active nest.</td>
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<td>− If at any time the biologist determines that WPF activities within the standard buffer is adversely affecting the behavior of the birds such that the nest is in jeopardy of failing, construction activities should retreat to honor the standard buffer until the nest is no longer active (i.e., the young have fledged).</td>
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<td>− Implement <strong>Mitigation Measure WPF-WQ-4 (RO Concentrate Management Study).</strong></td>
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<td>Impact WPF-BIO-3: The WPF could result in the loss of or damage to open water and wetland habitats that are considered Waters of the U.S. and/or State, a less-than-significant impact with mitigation.</td>
<td><strong>Mitigation Measure WPF-BIO-3a: Minimization of Impacts on Water Quality</strong> The following measures will be incorporated into the construction stormwater pollution prevention plan and implemented during construction of the WPF to avoid or minimize impacts on water quality:</td>
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<td>• Earth-moving in areas draining to wetlands and aquatic habitats will not occur during days when rain is occurring or predicted to occur (i.e., greater than 30 percent chance) during the work period.</td>
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<td>• All permit conditions, legal requirements, and appropriate dredging and engineering practices shall be followed to avoid and minimize water quality impacts associated with Master Plan activities. Suitable erosion control, sediment control, source control, treatment control, material management, and stormwater management BMPs will be implemented consistent with the latest edition of the California Stormwater Quality Association “Stormwater Best Management Practices Handbook,” available at <a href="http://www.capmphandbooks.com">www.capmphandbooks.com</a>.</td>
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<td>• Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). Feasible measures shall be implemented to ensure that hazardous materials are properly handled and the quality of aquatic resources is protected by all reasonable means when removing vegetation and sediments from the channels.</td>
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<td>• No fueling shall be done in areas immediately adjacent to (i.e., within 50 feet of) channels, ponds, or wetlands. For stationary equipment that must be fueled on site, containment shall be provided in such a manner that any accidental spill of fuel shall not be able to enter the water or contaminate sediments that may come in contact with water. Any equipment that is readily moved out of the channel shall not be fueled in the channel or immediate floodplain.</td>
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<td>• A hazardous materials management/fuel spill containment plan will be developed and implemented by the construction contractor and given to all contractors and biological monitors working on the WPF, with at least one copy of the plan located onsite at all times. The purpose of the plan is to provide onsite construction managers, environmental compliance monitors, and regulatory agencies with a detailed description of hazardous materials management, spill prevention, and spill response/cleanup measures associated with the construction of WPF elements. The primary objective of the plan is to prevent a spill of hazardous materials. Elements of the plan will include, but are not limited to the following:</td>
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<td><strong>Impact WPF-BIO-3 (cont.)</strong></td>
<td>- A discussion of hazardous materials management, including delineation of hazardous material and hazardous waste storage area, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas; &lt;br&gt; - Materials Safety Data Sheets for all chemicals used and stored on site; &lt;br&gt; - An inventory list of emergency equipment; &lt;br&gt; - Spill control and countermeasures including employee spill prevention/response training; &lt;br&gt; - Notification and documentation procedures; and &lt;br&gt; - A monthly reporting plan. &lt;br&gt; - Vehicles will be checked daily for oil or fuel leaks and will be washed only at an approved area. No washing of vehicles will occur outside of the main plant. &lt;br&gt; - The work site, areas adjacent to the site, and access areas will be maintained in an orderly condition, free and clear from debris and discarded materials. Personnel will not sweep, grade, or flush surplus materials, rubbish, debris, or dust onto adjacent areas or waterways. Upon completion of work, all building materials, debris, unused materials, concrete forms, and other construction-related materials will be removed from the WPF area. &lt;br&gt; - Stockpiled materials will be covered by plastic sheeting, tarps, or similar material that can be secured during wind and rain. A sediment fence or berm will be installed around stockpiled dredged material to prevent runoff from transporting sediment into sensitive habitats (such as the channels, ponds, and wetlands). Heavy equipment will not be operated in the active channels or within wetland habitats, but instead from existing hardscape, access roads, and levees. &lt;br&gt; - Water conservation methods will ensure that water used in the WPF area does not create surface flows capable of carrying pollutants to the nearby creek channel. All personnel, including sub-contractors will be instructed on the practical methods of preventing leaks or over-use of watering, and will be required to adhere to the practices in the detail sheets provided. Woody debris from tree trimming, and other activities will not be left in the active channels or in wetland habitats. &lt;br&gt; - In-channel vegetation removal may result in increased local erosion due to increased flow velocity. To minimize such erosion, the toe of the bank will be protected by leaving vegetation to the maximum extent practicable. &lt;br&gt; - Cofferdams or silt fencing will be used to the extent feasible during construction and maintenance activities that could potentially result in substantial siltation of open water. For any work within aquatic or wetland habitats, silt curtains will be installed to prevent suspended sediments from migrating out of the immediate work area, and dredging will be conducted on incoming tides to the extent feasible to further reduce the potential for sediment mobilization outside the Master Plan area. Dredging will be conducted with a closed clamshell-style dredge to reduce the amount of suspended sediment produced. Dredge volumes will be documented to ensure compliance with and adequate performance of these measures.</td>
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| Biological Resources (cont.) | Mitigation Measure WPF-BIO-3b: Avoidance of Open Water and Wetland Habitats.  
- Detailed design of the WPF will avoid and minimize impacts on open water and wetland resources to the extent feasible.  
- If open water and wetland habitats are present within 100 feet or less of the limits of disturbance in the Master Plan area, avoidance buffers shall be maintained between construction areas and the aquatic resources. These buffers should be at least 50 feet for general construction activities and 100 feet for grading, to the extent feasible. The avoidance buffers shall be designated as Environmentally Sensitive Areas and clearly identified in the field using orange fencing. No equipment, vehicles, or personnel are permitted within Environmentally Sensitive Areas. Environmentally Sensitive Areas shall be shown on Project plan sets. All Environmentally Sensitive Area fencing shall be maintained intact and in good condition throughout the duration of construction.  
- Any temporarily affected aquatic and wetland habitats will be restored to preconstruction elevations and contours, and temporarily affected wetlands will be revegetated using native plant species appropriate for the salinity, elevation, and location of the affected area. | |
| | Mitigation Measure WPF-BIO-3c: Compensatory Mitigation for Aquatic and Wetland Habitats.  
The District shall obtain permits from the USACE, RWQCB, and CDFW as needed to obtain authorization to affect jurisdictional waters. In order to ensure that the proposed WPF results in no net loss of wetland and aquatic habitat functions and values, the District shall compensate for the permanent loss of jurisdictional wetland and aquatic habitats through a combination of on-site and/or off-site restoration/creation and protection and enhancement of wetland habitat. The size and location(s) of the area(s) to be restored/created will be determined based on appropriate mitigation ratios derived in consultation with USACE, RWQCB, and CDFW, but the amount of compensatory mitigation provided shall be at least 1:1 (i.e., at least equivalent to the acreage of jurisdictional wetlands and other waters permanently affected). Prior to construction, the District will purchase credits from a mitigation bank approved by the applicable resource agencies and/or prepare a Mitigation and Monitoring Plan describing the proposed creation of mitigation wetlands that will satisfy the mitigation requirements. Impacts on jurisdictional wetlands and other waters may not commence until the adequate credits in a mitigation bank have been purchased and/or the District prepares the Mitigation and Monitoring Plan.  
The Mitigation and Monitoring Plan will be prepared by a qualified restoration ecologist and will include the following:  
- A summary of wetland impacts and the proposed wetland creation mitigation  
- Goals of the restoration to achieve no net loss of habitat functions and values  
- The location of the mitigation site and description of existing site conditions | |
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| **Impact WPF-BIO-3 (cont.)** | • Mitigation design:  
− Existing and proposed site hydrology, geomorphology, and geotechnical stability, if applicable  
− Grading plan if appropriate, including bank stabilization or other site stabilization features  
− Soil amendments and other site preparation elements as appropriate  
− Planting plan  
− Irrigation and maintenance plan  
− Construction schedule  
• Monitoring plan (including specific, objective final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.). Performance criteria will include the establishment of wetland vegetation on any vegetated wetland mitigation area within 5 years of mitigation implementation.  
• A contingency plan for mitigation elements that do not meet performance or final success criteria within 5 years; this plan will include specific triggers for remediation if performance criteria are not being met.  
• Implement Mitigation Measures WPF-BIO-2a (Worker Environmental Awareness Training), WPF-BIO-8a (Avoidance of Riparian Habitats), WPF-WQ-4 (RO Concentrate Management Study), and WPF-BIO-9 (Santa Clara Valley Habitat Conservation Plan Compliance). | |
| **Impact WPF-BIO-4:** The WPF could result in the loss of or damage to protected trees, a less-than-significant impact with mitigation. | **Mitigation Measure WPF-BIO-4a: Avoidance and Preservation of Trees.**  
During detailed design of Master Plan activities, ordinance-sized trees will be avoided to the extent feasible. If it is determined during detailed design that impacts on some trees can be avoided, a construction-phase Tree Preservation Plan shall be prepared by a certified arborist prior to initiation of construction to describe how trees that will not be removed will be protected. The construction-phase Tree Preservation Plan shall include the following tree protection measures, which are based on guidelines established by the International Society for Arboriculture:  
• Establish an area surrounding individual trees or groups of trees to be protected during construction as defined by a circle concentric with each tree with a radius 1-1/2 times the diameter of the tree canopy drip line. This Tree Protection Zone is established to protect the tree trunk, canopy and root system from damage during construction activities and to ensure the long-term survival of the protected trees. The Tree Protection Zone shall: (1) ensure that no structures or buildings, that might restrict sunlight relative to the existing condition, will be constructed in proximity to the trees; and (2) that no improvements are constructed on the ground around the tree within the Tree Protection Zone, thus ensuring that there is sufficient undisturbed native soil surrounding the tree to provide adequate moisture, soil nutrients and oxygen for healthy root growth. | Less than Significant |
### TABLE S-3 (Continued)
**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES**

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| Biological Resources (cont.) | • Protect tree root systems from damage caused by (a) runoff or spillage of noxious materials while mixing, placing, or storing construction materials and (b) ponding, eroding, or excessive wetting caused by dewatering operations through use of the following measures during excavation and grading:  
  − Excavation: Do not trench inside tree protection zones. Hand excavate under or around tree roots to a depth of 3 feet. Do not cut main lateral tree roots or taproots. Protect exposed roots from drying out before placing permanent backfill.  
  − Grading: Maintain existing grades within tree protection zones. Where existing grade is 2 inches or less below elevation of finish grade, backfill with topsoil or native site soil. Place fill soil in a single uncompacted layer and hand grade to required finish elevation.  
  − Apply 6-inch average thickness of wood bark mulch inside tree protection zones. Keep mulch 6 inches from tree trunks.  
  • Provide 48-inch tall orange plastic construction fencing fastened to steel T-posts, minimum six (6) feet in length, using heavyweight plastic ratchet ties. Install fence along edges of tree protection zones before materials or equipment are brought on site and construction operations begin. Maintain fence in place until construction operations are complete and equipment has been removed from site.  
  • Provide temporary irrigation to all trees in protection zones using a temporary on-grade drip or bubbler irrigation system sufficient to wet the soil within tree protection zones to a depth of 30 inches per bi-weekly irrigation event.  
  **Mitigation Measure WPF-BIO-4b: Tree Replacement.**  
  For WPF areas within Sunnyvale where such avoidance is not feasible, at the discretion of the Sunnyvale Director of Community Development, the District will replace any removed protected trees within Sunnyvale at a 1:1 ratio; if replacement cannot occur, an in-lieu fee will be required.  
  **Mitigation Measure WPF-BIO-4c: WPF Mitigation for Impacts on Protected Trees.**  
  For WPF areas outside the City of Sunnyvale, prior to pipeline construction in a given area, the District will require that a survey be performed to identify ordinance-sized trees within the impact area, with “ordinance size” being determined by the ordinance of the city in which the impacts would occur. Such trees will be avoided to the extent feasible following the construction-phase tree protection measures described above under Mitigation Measure WPF-BIO-4a. Where such avoidance is not feasible, the District will replace all affected trees in a manner that is consistent with the local ordinances that protect trees in the city in which the impact occurs. Compensatory mitigation will be provided via tree replacement based upon the number of individual trees removed and/or their size, and further, the trees species that will be affected may also be considered (depending on the tree ordinance of the city in question). | |
### TABLE S-3 (Continued)
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<td><strong>Impact WPF-BIO-5:</strong> The WPF could result in interference with the movement of native resident or migratory fish or wildlife species, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
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| **Impact WPF-BIO-7:** The WPF could result in impacts on nesting birds and roosting bats, a less-than-significant impact with mitigation. | **Mitigation Measure WPF-BIO-7: Roosting Bat Measures.**<br>The District will implement the following measures to minimize impacts on roosting bats:  
- Within 30 days prior to the onset of WPF pipeline work activities on, or within 100 feet of, a bridge or overpass, a qualified biologist will conduct a survey for evidence of bat use. If evidence is observed, or if potential roost sites are present in areas where evidence of bat use might not be detectable, an evening survey and/or nocturnal acoustic survey may be necessary to determine if the bat colony is active and to identify the specific location of the bat colony.  
- If an active bat colony consisting of 10 or more bats is determined to be present, the qualified biologist will make one of the following determinations, based on the location of the colony relative to the location and nature of the pipeline construction activities:  
  - The work can proceed without unduly disturbing the bat colony, and no additional measures to avoid or minimize impacts are necessary.  
  - There is a need for a buffer zone to prevent disturbance to the bat colony, and implementation of the buffer zone (which will be determined on a case-by-case basis by a qualified biologist) will reduce or eliminate the disturbance to an acceptable level.  
  - Work cannot proceed without unduly disturbing the bat colony. If this determination is made, the work will not occur during the maternity season (1 April through 31 July) to avoid impacts on maternity colonies.  
- If a nonbreeding bat roost (i.e., a non-maternity roost, or a roost occupied between 1 August and 31 March) is found in a structure that must be physically disturbed, the qualified biologist will determine whether eviction of bats is necessary to avoid direct mortality of individuals. If eviction is necessary, the biologist will identify and implement the appropriate eviction measures in consultation with the CDFW. | Less than Significant |
### TABLE S-3 (Continued)

#### SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

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<tr>
<th>Impacts</th>
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<tr>
<td><strong>Biological Resources (cont.)</strong></td>
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<td><strong>Less than Significant</strong></td>
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</table>
| Impact WPF-BIO-8: The WPF could result in the loss of or damage to riparian habitat, a less-than-significant impact with mitigation. | **Mitigation Measure WPF-BIO-8a: Avoidance of Riparian Habitats.**  
- Impacts on riparian habitat will be avoided and minimized to the extent feasible during pipeline installation.  
- If riparian habitats are present within 50 feet or less of the limits of disturbance for pipeline installation, avoidance buffers shall be maintained between construction areas and the aquatic resources. These buffers should be at least 30 feet for general construction activities and 50 feet for grading, to the extent feasible. The avoidance buffers shall be designated as Environmentally Sensitive Areas and clearly identified in the field using orange fencing. No equipment, vehicles, or personnel are permitted within Environmentally Sensitive Areas. Environmentally Sensitive Areas shall be shown on WPF plan sets. All Environmentally Sensitive Area fencing shall be maintained intact and in good condition throughout the duration of construction.  
- Cutting and trimming of riparian shrubs and trees will be minimized during construction and maintenance activities to the maximum extent feasible. Shrubs that need to be trimmed should be cut at least 1 foot above ground level to leave the root systems intact and allow for regeneration. Removal or trimming of riparian vegetation will be conducted by a certified arborist.  
- Any temporarily affected riparian habitats will be restored to preconstruction elevations and contours, and revegetated using native plant species appropriate for the impact area. | |
### TABLE S-3 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

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</table>
| **Impact WPF-BIO-8 (cont.)** | • The location of the mitigation site and description of existing site conditions  
• Mitigation design:  
  − Existing and proposed site hydrology, geomorphology, and geotechnical stability, if applicable  
  − Grading plan if appropriate, including bank stabilization or other site stabilization features  
  − Soil amendments and other site preparation elements as appropriate  
  − Planting plan  
  − Irrigation and maintenance plan  
  − Construction schedule  
• Monitoring plan (including specific, objective final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.). Performance criteria will include at least 30 percent canopy cover by woody riparian vegetation on the mitigation site within 5 years of mitigation implementation, or as required by the applicable permit from the CDFW or other regulatory agencies.  
• A contingency plan for mitigation elements that do not meet performance or final success criteria within 5 years; this plan will include specific triggers for remediation if performance criteria are not being met. | |
| **Impact WPF-BIO-9:** The WPF could conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan, a less-than-significant impact with mitigation. | **Mitigation Measure WPF-BIO-9: Santa Clara Valley Habitat Conservation Plan Compliance.**  
The District will comply with the conditions of the Habitat Plan by applying conditions of the Habitat Plan for WPF activities that are within the Habitat Plan area and will pay applicable impact fees for those WPF activities, including fees for effects on stream, wetland, and riparian habitats. The Santa Clara Valley Habitat Agency will then use those fees to acquire, preserve, manage, and restore populations of the covered species and the sensitive habitats that are affected by the WPF.  
The District will also adhere to all applicable Habitat Plan conditions during WPF implementation. Such conditions may include Conditions 1 (Avoid Direct Impacts on Legally Protected Plant and Wildlife Species), 3 (Maintain Hydrologic Conditions and Protect Water Quality), 4 (Avoidance and Minimization for In-Stream Projects), 12 (Wetland and Pond Avoidance and Minimization), 17 (Tricolored Blackbird), and possibly others. In particular, if WPF pipeline construction necessitates trenching across any streams within the Habitat Plan area, a number of avoidance and minimization measures associated with Condition 4 would need to be implemented. | **Less than Significant** |
| **Impact C-BIO-1:** Implementation of the Master Plan and WPF, in combination with other projects, would have a potentially significant contribution to cumulative impacts on biological resources, a significant and unavoidable impact. | No additional mitigation required. | **Significant and Unavoidable** |
### Geology, Soils, Seismicity, and Mineral Resources

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<tr>
<td><strong>Impact WPF-GEO-1:</strong> The WPF could result in damage to or failure of utility lines due to strong ground shaking or liquefaction during an earthquake, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF-GEO-2:</strong> The WPF would result in exposure of structural components to the effects of unstable soil conditions, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact C-GEO-1:</strong> Implementation of the WPF, in combination with other projects, could result in cumulative impacts related to geology, soils, seismicity, and mineral resources.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
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### Hydrology

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<tr>
<td><strong>Impact WPF-HYD-1:</strong> The WPF would generate additional sources of stormwater runoff that could degrade water quality, a less-than-significant impact with mitigation.</td>
<td><strong>Mitigation Measure WPF-HYD-1a:</strong> Schedule Construction Activities at Creek Crossings During the Dry Season. The SWPPP, to be submitted in accordance with the Construction General Stormwater Permit, will include a schedule for construction activities that specifies a timeline for earthmoving activities, hyroseeding, and stabilization of soils and slopes. Incorporate into contract specifications that, in addition to the requirements of the Construction General Stormwater Permit, the contractor will limit construction activities within the 100-year flood zone of Los Gatos Creek to the dry season. The schedule will indicate that all earthmoving activities at these creeks will occur during the dry season (i.e., between June 1 and October 15), unless otherwise negotiated with the appropriate regulatory agencies.</td>
<td>Less than Significant</td>
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<td></td>
<td><strong>Mitigation Measure WPF-HYD-1b:</strong> Hydraulic Analyses for Stream Crossings. To reduce the potential for water quality degradation resulting from stream scour, during the design phase of the WPF pipelines hydraulic analyses shall be completed for all stream crossings. The following considerations shall be included in the hydraulic analyses:</td>
<td>Less than Significant</td>
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<td>• Surface crossings should be located above the 100-year flood elevation, and preferably above the 500-year flood elevation</td>
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<td>• Subsurface crossings should be designed to account for channel degradation (lowering of the stream bed), the detection of which could be based upon comparative channel survey data, specific gauge analysis (plotting the change in stream stage over time at one stream gauge location), bridge inspection reports, or other quantitative techniques</td>
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<td>• Subsurface crossings design should also address the potential for contraction scour within the affected stream reach</td>
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### TABLE S-3 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

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<tr>
<td><strong>Hydrology (cont.)</strong></td>
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<tr>
<td><strong>Impact WPF-HYD-2:</strong> The project could temporarily or permanently alter drainage patterns by installing pipelines across or under creeks, a less-than-significant impact with mitigation.</td>
<td>Implement Mitigation Measures WPF-HYD-1a (Schedule Construction Activities at Creek Crossings During the Dry Season) and WPF-HYD-1b (Hydraulic Analyses for Stream Crossings).</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF-HYD-3:</strong> The WPF could expose structures to loss resulting from flooding, and could place structures within a 100-year flood hazard area, a less-than-significant impact with mitigation.</td>
<td>Implement Mitigation Measures WPF-HYD-1a (Schedule Construction Activities at Creek Crossings During the Dry Season) and WPF-HYD-1b (Hydraulic Analyses for Stream Crossings).</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF-HYD-4:</strong> The WPF would affect groundwater levels and storage during construction or recharge operations, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact C-HYD-1:</strong> Implementation of the WPF, in combination with other projects, could result in cumulative impacts to hydrology.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
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<tr>
<td><strong>Water Quality</strong></td>
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<tr>
<td><strong>Impact WPF-WQ-1:</strong> Water generated at the WPF, when used for Groundwater Replenishment (GWR), could adversely affect groundwater quality, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF-WQ-2:</strong> Water generated at the WPF used for GWR would be potentially used for potable purposes, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF-WQ-3:</strong> Increased recycled water production by the WPF would reduce the discharge through the existing outfall into the Bay, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
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</table>
**TABLE S-3 (Continued)**

**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES**

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<td><strong>Water Quality (cont.)</strong></td>
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</table>
| Impact WPF-WQ-4: Increased recycled water production using reverse osmosis treatment processes under the WPF would generate a new concentrate stream. Concentrate management would have the potential to affect receiving water quality, a less-than-significant impact with mitigation. | Mitigation Measure WPF-WQ-4: RO Concentrate Management Study  
In coordination with regulatory agencies, the City and/or District will develop a RO concentrate management study that identifies phasing and implementation of RO concentrate management options that maintain compliance with applicable NDPES permit requirements.  
- For use of the City’s existing outfall, the study will review compliance with NPDES permit requirements under conditions of blending the RO concentrate with the remaining available WPCP effluent. The studies will generally include: development of blended effluent and RO concentrate mass balance calculations and laboratory chronic toxicity testing of a range of effluent and RO concentrate blends to evaluate compliance with the City’s NPDES permit limits.  
- For use of the EBDA outfall, the City and/or District will review discharge requirements and other institutional arrangements for participation in EBDA. This would include: development of RO concentrate mass balance calculations and laboratory testing to evaluate compliance with EBDA’s combined NDPES permit requirements.  
- For use of treatment wetlands, the City and/or District will coordinate with the RWQCB and other regulatory agencies, such as USACE, USFWS, CDFW, and BCDC regarding use of concentrate to support wetlands and protect receiving water quality consistent with the water quality objectives of the San Francisco Bay Water Quality Control Plan (Basin Plan). This process will generally include development of effluent calculations, pilot testing, or other mechanism acceptable to the RWQCB to identify:  
  - Effluent blending ratios,  
  - Use of other potential blending source waters (such as pre-blending with Bay water or stormwater),  
  - Calculation of specific concentrations of constituents of concern (metals, pesticides), and  
  - Identification of chronic and acute toxicity to demonstrate protection of receiving water quality. | Less than Significant |
<p>| Impact C-WQ-1: Implementation of the WPF, in combination with other projects, could result in cumulative impacts to water quality. | No additional mitigation required. | Less than Significant |
| <strong>Hazards and Hazardous Materials</strong> | | |
| Impact WPF-HAZ-1: Project operation would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, a less-than-significant impact. | None required. | Less than Significant |</p>
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<td>Hazards and Hazardous Materials (cont.)</td>
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<tr>
<td>Impact WPF-HAZ-2: Project construction could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials, a less-than-significant impact with mitigation.</td>
<td>Implement Mitigation Measures HAZ-2a (Hazardous Building Materials Abatement), HAZ-2b (Health and Safety Plan) and HAZ-2c (Soil and Groundwater Management Plan). Mitigation Measure WPF-HAZ-2a: Health and Safety Plan For any elements involving ground disturbing activities, the District or its contractor will prepare a Health and Safety Plan in accordance with federal OSHA regulations (29 CFR 1910.120) and Cal/OSHA regulations (8 CCR Title 8, Section 5192). The Plan will be based on all the proposed WPF improvements involving ground disturbance and include designated personnel responsible for implementation of the Health and Safety Plan. The District will require each contractor for each individual construction contract to implement the Plan. The Plan will include all required measures to protect construction workers and the general public potentially exposed to hazardous materials or wastes by including engineering controls, monitoring, and security measures to prevent dangerous levels of exposure and unauthorized entry to the construction area, and to reduce hazards outside of any construction area. If prescribed contaminant exposure levels are exceeded, personal protective equipment shall be required for workers in accordance with state and federal regulations. Compliance with the District’s Health and Safety Plan will not be construed as approval of the adequacy of the contractor’s health and safety professional’s qualifications or any safety measure taken in or near the construction site. The contractor will be solely and fully responsible for compliance with all laws, rules, and regulations applicable to health and safety during the performance of the construction work. Mitigation Measure WPF-HAZ-2b: Soil and Groundwater Management Plan For any elements involving ground disturbing activities, the District will require the construction contractor to implement a Soil and Groundwater Management Plan, subject to review by the District that specifies the method for handling and disposal of contaminated soil and groundwater prior to demolition, excavation, and construction activities. The plan will include all necessary procedures to ensure that any excavated materials and fluids generated from throughout the WPF areas during construction are stored, managed, and disposed of in a manner that is protective of human health and in accordance with applicable laws and regulations. The plan will include the following information. * Step-by-step procedures for evaluation, handling, stockpiling, storage, testing, and disposal of excavated material, including criteria for reuse and offsite disposal. All excavated materials shall be inspected prior to initial stockpiling, and spoils that are visibly stained and/or have a noticeable odor shall be stockpiled separately to minimize the amount of material that may require special handling. * Procedures to be implemented if unknown subsurface conditions or contamination are encountered, such as previously unreported tanks, wells, or contaminated soils. * Detailed control measures for use and storage of hazardous materials to prevent the release of pollutants to the environment, and emergency procedures for the containment and cleanup of accidental releases of hazardous materials to minimize the impacts of any such release. These procedures shall also include reporting requirements in the event of a reportable spill or other emergency incident. At a minimum, the District or its contractor shall notify applicable agencies in accordance with guidance from the California Office of Emergency Services as well as the Santa Clara County Environmental Health Department.</td>
<td>Less than Significant</td>
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### TABLE S-3 (Continued)
**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES**

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<tr>
<td><strong>Impact WPF-HAZ-2 (cont.)</strong></td>
<td>• Procedures for containment, handling and disposal of groundwater generated from construction dewatering, the method used to analyze groundwater for hazardous materials likely to be encountered at specific locations and the appropriate treatment and/or disposal methods.</td>
<td></td>
</tr>
<tr>
<td><strong>Impact WPF-HAZ-3: The project could be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment, a less-than-significant impact with mitigation.</strong></td>
<td>Implement Mitigation Measures WPF-HAZ-2a (Health and Safety Plan) and WPF-HAZ-2b (Soil and Groundwater Management Plan). Mitigation Measure WPF-HAZ-3a. Injection Well Siting and Design. The District will require a Phase I Environmental Site Assessment of proposed injection wells sites to identify hazardous materials uses and facilities with known soil and/or groundwater contamination with the potential to affect groundwater at proposed injection well locations. If facilities with the potential to contaminate groundwater are identified within ¼-mile of proposed well locations, the District shall retain a licensed hydrogeologist to evaluate the potential for contamination to affect WPF aquifers and to identify appropriate measures to ensure that groundwater in the target injection well aquifer is not affected by shallow groundwater contamination. Such measures could include, but are not limited to, relocation of the proposed injection facility, installation of well casing to seal off the upper aquifer from lower units, or similar measures. All protective measures shall be incorporated into the design of or contract specifications for the injection wells. Mitigation Measure WPF-HAZ-3b: Purified Water Pipeline Siting and Design Prior to any pipeline construction activities, the District or its contractor will conduct an initial site investigation of proposed purified water pipeline sites to confirm the absence of contaminated soil or groundwater that may exist within the area to be excavated. Additional investigations may be required based on the results of the initial investigation. Regardless of the results of the investigation, any hazardous materials that are found during construction of the pipeline would be handled in compliance with applicable laws and regulations regarding transport, handling, disposal, and storage. All federal, state, and local reporting requirements would be followed regarding the use and handling of hazardous and non-hazardous materials at the project site.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF-HAZ-4: The WPF facilities at the WPCP would be within two miles of Moffett Federal Airfield, but would not affect the safety hazard for WPCP workers, a less-than-significant impact.</strong></td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF-HAZ-5: The project would not impair or interfere with an adopted emergency response plan or emergency evacuation plan but could interfere with emergency response provider access, a less-than-significant impact with mitigation.</strong></td>
<td>Implement Mitigation Measure WPF-TR-1 (Implement a Temporary Traffic Control Plan).</td>
<td>Less than Significant</td>
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### TABLE S-3 (Continued)
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<tr>
<td>Impact WPF-HAZ-6: The project would not result in significant health hazards from hazardous emissions or the handling hazardous materials within 0.25 mile of an existing or proposed school, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-HAZ-1: The project could result in cumulatively considerable impacts related to hazards and hazardous materials.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
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<tr>
<td><strong>Public Services and Facilities</strong></td>
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</tr>
<tr>
<td>Impact WPF-PS-1: The project would not result in substantial adverse physical impacts associated with the need for new or altered police and fire protection facilities in order to maintain acceptable service ratios, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-PS-1: Implementation of the WPF, combined with other projects in the area, could result in cumulative impacts on public services and facilities.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
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<tr>
<td><strong>Utilities and Service Systems</strong></td>
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<tr>
<td>Impact WPF-UT-1: There would be sufficient permitted capacity to accommodate the project’s solid waste disposal needs, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact WP-UT-2: The project would be in compliance with federal, state, and local statutes and regulations related to solid waste, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Impact C-UT-1: Implementation of the WPF, combined with other projects in the area, could result in cumulative impacts on utilities and service systems.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
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### Summary of Impacts and Mitigation Measures for Water Purification Facilities

#### TABLE S-3 (Continued)
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<td><strong>Cultural Resources</strong></td>
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</table>
| Impact WPF-CUL-1: The project could result in a substantial adverse change in the significance of a historical resource, a less-than-significant impact with mitigation. | Mitigation Measure WPF-CUL-1: Project-Level Cultural Resources Assessment. When project-level plans for the WPF are submitted, the District will retain a Secretary of the Interior-qualified archaeologist. Each proposed project location will be subject to a cultural resources investigation that includes, at a minimum, the following:  
- A records search at the Northwest Information Center to identify cultural resources within or near the WPF location(s).  
- If deemed warranted by the results of the records search, a surface survey of the proposed WPF location(s) to examine for the presence of cultural resources.  
- A memorandum disseminating the results of the background research, field work, findings, and appropriate maps and photos.  
- Site-specific measures to mitigate any adverse impacts to recorded and/or undiscovered cultural resources. Measures could include archaeological and Native American monitoring, redesign of the project to avoid known significant resources, or evaluation to determine the significance of newly discovered cultural resources. | Less than Significant |
| Impact WPF-CUL-2: The project could result in a substantial change in the significance of an archaeological resource, a less-than-significant impact with mitigation. | Implement Mitigation Measure WPF-CUL-1, Project-Level Cultural Resources Assessment and Mitigation Measure CUL-2, Unanticipated Discovery of Archaeological Resources. | Less than Significant |
| Impact WPF-CUL-3: The project could result in direct or indirect impacts on paleontological resources, a less-than-significant impact with mitigation. | Implement Mitigation Measure CUL-3, Unanticipated Discovery of Paleontological Resources. Mitigation Measure WPF-CUL-3: Project-Level Paleontological Resources Assessment. When project-level plans for the WPF are submitted, the District will retain a qualified paleontologist. Each proposed project location will be subject to a paleontological resources investigation that includes, at a minimum, the following:  
- Background research at the University of California Museum of Paleontology database to identify paleontological resources within or near the WPF location(s).  
- If deemed warranted by the results of the records search, a surface survey of the proposed WPF location(s) to examine for the presence of paleontological resources.  
- A memorandum disseminating the results of the background research, field work, findings, and appropriate maps and photos.  
- Recommendations for additional paleontological resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered paleontological resources. Measures could include paleontological monitoring or redesign of the project to avoid known significant resources. | Less than Significant |
### TABLE S-3 (Continued)

**SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES**

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<tr>
<td><strong>Impact WPF-CUL-4:</strong> The project could result in disturbance of human remains, a less-than-significant impact with mitigation.</td>
<td>Implement Mitigation Measure CUL-4, Accidental Discovery of Human Remains and Mitigation Measure WPF-CUL-1, Project-Level Cultural Resources Assessment.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact C-CUL-1:</strong> Implementation of the WPF, combined with other projects, could result in cumulative impacts on Cultural and Paleontological Resources.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Aesthetics</strong></td>
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<tr>
<td><strong>Impact WPF-AES-1:</strong> The WPF would not degrade the existing visual character of the site, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF AES-2:</strong> The WPF would not create a new source of light or glare, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact C-AES-1:</strong> Implementation of the WPF, combined with other projects, could result in cumulative impacts on aesthetic resources.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Energy Conservation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact WPF-ENER-1:</strong> Construction and operation of the WPF would not result in use or fuel or energy in a wasteful manner, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact WPF-ENER-2:</strong> Implementation of the WPF would not conflict with applicable energy policies or standards, a less-than-significant impact.</td>
<td>None required.</td>
<td>Less than Significant</td>
</tr>
<tr>
<td><strong>Impact C-ENER-1:</strong> Implementation of the WPF, combined with other projects in the area, would not result in cumulative impacts to local and regional energy resources by resulting in wasteful, inefficient, and/or unnecessary consumption of energy.</td>
<td>No additional mitigation required.</td>
<td>Less than Significant</td>
</tr>
</tbody>
</table>
### TABLE S-3 (Continued)
#### SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WATER PURIFICATION FACILITIES

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance after Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Growth Inducement Potential and Secondary Effect of Growth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact GI-1: The project would support planned growth in the WPCP and</strong></td>
<td><strong>Mitigation Measure GI-1: Update Projections</strong></td>
<td>Significant and unavoidable for some secondary effects of growth.</td>
</tr>
<tr>
<td><strong>District service areas</strong> that would result in secondary effects on the**</td>
<td>Prior to implementation of Stage 2 of the conventional activated sludge and Stage 2 of solids thickening and dewatering facilities and processes, Stage 2 of the MBR facilities and Stage 2 of WPF solids thickening and dewatering facilities, or construction of a fifth digester, the City will: (1) initiate a new investigation of flows and loads capacity requirements to ensure that these facilities are appropriately sized to accommodate projected capacity needs consistent with (then) adopted plans and policies; and (2) require that CEQA documents on development projects evaluate nitrogen deposition impacts on serpentine habitat and associated special-status species, and mitigate significant project-specific and cumulative impacts to less-than-significant levels. The analysis requirements and specific mitigation strategy(ies) will depend on the environmental setting at the time the Master Plan or WPF improvements are implemented, characteristics of the proposed development, and its relative contribution to the significant impact.</td>
<td></td>
</tr>
<tr>
<td><strong>physical environment. Implementation of the project’s wastewater treatment capacity improvements could also support a degree of population and/or employment above that planned for in Sunnyvale’s adopted General Plan, a significant and unavoidable impact.</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 1
Introduction

1.1 Purpose of the Program Environmental Impact Report

1.1.1 Purpose of the EIR

The City of Sunnyvale (City), as the lead agency, has prepared this draft program environmental impact report (PEIR) for the Sunnyvale Water Pollution Control Plant (WPCP) Master Plan (Master Plan) in compliance with the California Environmental Quality Act (CEQA) and the CEQA Guidelines. The PEIR is a public document for use by the City, other governmental agencies, and the public in identifying and evaluating the potential environmental consequences of a project, identifying mitigation measures to lessen or eliminate adverse impacts, and examining feasible alternatives to the Master Plan. The impact analyses in this report are based on a variety of sources listed in each relevant impact section. The City will review and consider the information contained in this PEIR prior to the ultimate decision to approve, disapprove, or modify the Master Plan.

1.1.2 Type of EIR

The City chose to prepare a program EIR for the Master Plan consistent with CEQA Guidelines Section 15168. A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:

- Geographically;
- As logical parts in the chain of contemplated actions;
- In connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or
- As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects that can be mitigated in similar ways.

The elements included in the Master Plan meet the above criteria. The proposed activities were developed under a common planning initiative (the Master Plan) and would generally occur in the area within and around the existing WPCP. Many elements of the Master Plan are logical parts in a chain of contemplated actions to renovate the treatment plant to meet a set of
objectives. There are several advantages to preparing a program EIR on a project like the Master Plan. Preparation of a program EIR for a project like the Master Plan allows for consideration of broader alternatives (e.g., an alternative site plan or treatment process) when the City has greater flexibility to modify the Plan. Preparation of a program EIR also accommodates development of program-wide mitigation strategies that might not be practical on an individual action. Preparation of a program EIR also ensures consideration of the cumulative impacts that can be slighted in a case-by-case analysis of individual actions. Lastly, the program EIR can provide comprehensive consideration of certain issues so that they do not need to be revisited in subsequent environmental evaluation of individual actions undertaken as part of Master Plan implementation.

Level of Detail in the PEIR

The City actions that this PEIR addresses include approval of the WPCP Master Plan and endorsement of a site plan for the WPCP that could accommodate Water Purification Facilities, should the City and the Santa Clara Valley Water District (District) choose to pursue that option. The PEIR evaluates the foreseeable environmental effects that can be expected to follow these approval actions. Detailed design and construction information is not currently available on the improvements described in the Master Plan. The level of detail contained in the PEIR mirrors that contained in the Master Plan and the information currently available on the proposed Water Purification Facilities. Consequently, evaluations in the PEIR are not as detailed as (for example) those in an EIR prepared for a specific construction project.1

Use of the PEIR in Later Activities: Tiering

The City will undertake further environmental review pursuant to CEQA when a determination is made to implement a WPCP improvement evaluated in the PEIR, conceptual design is completed and construction details developed, and prior to approval of that individual project. At that time, this PEIR can be used to simplify the task of preparing environmental documents on that facility or action through tiering.2 Tiering under CEQA “refers to the analysis of general matters contained in a broader EIR [in this case, the PEIR] with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project.”3 CEQA encourages agencies to tier environmental analyses as a means to eliminate repetitive discussions of the same issues and focus the later EIR on the actual issues ripe for decision. As part of the tiering process, the City will use the PEIR in conjunction with detailed information on the individual project to determine whether impacts were adequately addressed in the PEIR.

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1 The CEQA Guidelines (Section 15146(a)) state that “the degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR.”
2 Refer to CEQA Guidelines Sections 15168(d) and 15152(a).
3 CEQA Guidelines, Section 15152.
Likewise, in implementing Water Purification Facilities the District could use information contained in the PEIR to streamline subsequent environmental review.

1.2 Overview of CEQA EIR Process

1.2.1 Notice of Preparation and Scoping

In accordance with Sections 15063 and 15082 of the CEQA Guidelines, the City prepared a Notice of Preparation (NOP) for this PEIR to solicit input from interested parties regarding the scope and content of the PEIR. The NOP was circulated to local, state, and federal agencies on June 15, 2015. Comments were accepted until July 15, 2015. The NOP provided a general description of the proposed action, a review of the proposed facilities and land uses, and a preliminary list of environmental issues to be addressed in the PEIR. The City also conducted two public meetings on June 24, 2015, to present the Master Plan, the NOP and the CEQA Process. Appendix A of this Draft PEIR includes the NOP and comments received during the scoping period.

1.2.2 Draft PEIR

Publication of this Draft PEIR marks the beginning of a 45-day public review and comment period. During this period, the Draft PEIR will be available to local, state, and federal agencies and to interested organizations and individuals for review. Notice of this Draft PEIR will also be sent directly to every agency, person, or organization that commented on the NOP. Written comments concerning the environmental review contained in this Draft PEIR should be emailed, mailed or hand delivered during the 45-day public review period to:

Alison Hood  
City of Sunnyvale Department of Public Works  
456 West Olive Avenue  
Sunnyvale, CA 94086  
Email: AHood@sunnyvale.ca.gov

1.2.3 Final PEIR

Following conclusion of the public review period, the City will prepare and publish responses to comments received on this Draft PEIR which, together with this Draft PEIR, will constitute the Final PEIR. The Responses to Comments Document will also stipulate any changes to the Draft PEIR resulting from public and agency input.

After the Final PEIR has been completed, the City will then consider PEIR certification at a regularly scheduled meeting. Upon PEIR certification, the City may proceed with project approval actions (e.g., City Council adoption of the Master Plan). CEQA requires that the lead agency neither approve nor implement a project unless the project’s significant environmental effects have been reduced to less-than-significant levels\(^4\), essentially “eliminating, avoiding, or

\(^4\) California Public Resources Code, Section 21002.
substantially lessening” the expected impacts unless specific findings are made (i.e., regarding the infeasibility of project alternatives and mitigation measures). If the lead agency approves the project despite there being residual significant adverse impacts that cannot be mitigated to less-than-significant levels, the agency must state the reasons for its action in writing. This Statement of Overriding Considerations must be included in the record of project approval.

### 1.2.4 Mitigation Monitoring and Reporting

State law requires lead agencies to adopt a mitigation monitoring and reporting program for those changes to the project that it has adopted or made a condition of project approval in order to mitigate or avoid significant impacts on the environment. The CEQA Guidelines do not require that the specific reporting or monitoring program be included in the EIR. Throughout this PEIR, proposed mitigation measures have been clearly identified within the Summary and Chapter 4 and presented in language that will facilitate establishment of a monitoring program. All adopted measures will be included in a mitigation monitoring and reporting program (which will be available as part of the materials presented before the City Council in preparation for Master Plan approval) to verify compliance.

### 1.3 Organization of the EIR

As shown in the Table of Contents, this PEIR is organized into 9 chapters. Background information describing the existing processes at the WPCP is provided in Chapter 2, Project Background. Chapter 3, Project Description, describes the project location and boundaries, project objectives, a general description of the characteristics of the Master Plan and Water Purification Facilities, and a brief description of the intended uses of the PEIR. The potential environmental consequences are identified, by resource area (for example Transportation, Air Quality, or Hydrology) in Chapter 4, Environmental Setting, Impacts, and Mitigation. Growth inducement effects and cumulative impacts of the project are analyzed in Chapter 5, Growth Inducement Potential and Secondary Effects of Growth and Chapter 6, Cumulative Impacts and Other CEQA Issues, respectively. Chapter 7, Alternatives to the Proposed Project, identifies the range of reasonable and potentially feasible alternatives to the project, describes the alternative selection process, and summarizes the comparison of the alternatives. The preparers of the PEIR are identified in Chapter 8, List of Preparers, and Chapter 9 lists acronyms and abbreviations used in the PEIR.
CHAPTER 2  
Project Background

Sections | Figures
--- | ---
2.1 Existing WPCP Operations | 2-1 WPCP Water Treatment Process
  2.1.1 Service Area | 2-2 Existing WPCP Process Areas
  2.1.2 WPCP Operations | |
2.2 WPCP Master Plan Process | |
2.3 Santa Clara Valley Water District Recycled Water Planning | |
  2.3.1 Expedited Recycled and Purified Water Program | |
2.4 Other Projects at the WPCP | |
2.5 References | |

2.1 Existing WPCP Operations

2.1.1 Service Area

The Donald M. Somers Water Pollution Control Plant (WPCP) provides treatment of wastewater flows and loads from domestic, commercial, and industrial sources in Sunnyvale, Rancho Rinconada, and Moffett Field. The service area has a total population of about 147,000 (City of Sunnyvale, 2015). The WPCP was originally constructed in 1956. With the enactment of the Clean Water Act in 1972, more restrictive water quality standards were established, leading to expansion of and process upgrades to the WPCP. In 1978, the City added tertiary treatment to WPCP operations. Currently (2015), the WPCP processes about 14.5 million gallons per day (mgd) average dry weather flow.\(^1\)

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1 Average dry weather flow, or ADWF, is the average of the daily average flow during the three month period between June and September (the driest times of the year in Sunnyvale) that produces the minimum flow.
2.1.2 WPCP Operations

The WPCP includes an approximately 16.6-acre main plant and two oxidation ponds. Operations at the WPCP can be divided into preliminary and primary treatment, secondary treatment, tertiary treatment, and solids treatment processes. Figure 2-1 presents a schematic flow diagram of the liquid and solid stream treatment processes at the WPCP. Figure 2-2 identifies the location of existing process areas and facilities within the WPCP operational area.

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**Preliminary and Primary Treatment**

The preliminary and primary treatment facilities are currently being rebuilt. The basic processes are described here to provide an overall understanding of WPCP operations.

The goal of preliminary and primary treatment is to remove solid matter from the influent. Preliminary treatment currently involves pumping the wastewater through large grinders (to be replaced by a screening facility), which break down the larger solids. Next, the wastewater is pumped up to ground level and to the pre-aeration tanks, where heavier, sand-sized material (grit) is removed from the wastewater to protect downstream equipment from wear. The inorganic grit is removed from the wastewater, washed, and transported offsite for disposal. Following grit removal, the wastewater undergoes primary treatment in sedimentation basins, where heavier organic materials (sludge) settle to the bottom, and scum (buoyant material such as oil and grease)

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2 Oxidation ponds are bodies of wastewater where oxygen is added to the water to promote the growth of algae and microorganisms, which consume solids and nutrients.

3 The Primary Treatment Facility project includes construction of new preliminary and primary treatment facilities and related improvements at the site. For a description of the Primary Treatment Facility project, see Section 2.4 and Chapter 6, *Cumulative Impacts and Other CEQA Issues.*
NOTE: New preliminary and primary treatment facilities will be constructed at the WPCP starting in 2016.
floats to the top (about 60 percent of the solids are removed in this process). Sludge and scum pumps convey settled solids and floatables from the tanks to the digesters. The remaining wastewater, which is now called primary effluent, flows to the oxidation ponds for secondary treatment.

**Secondary Treatment**

The goal of secondary treatment is to remove most of the remaining dissolved and suspended (non-settleable) solids in the primary effluent. This occurs through a combination of natural and engineered processes. The primary effluent is biologically treated in the WPCP’s oxidation ponds, which were constructed in 1965. Effluent from the oxidation ponds is pumped to the fixed growth reactors, where further biological treatment occurs. Effluent from the fixed growth reactors flows to the air flotation tanks, which remove the algae prior to filtration.

**Oxidation Ponds**

Currently primary effluent is conveyed to the recirculation channels which distribute flow to 400 acres of oxidation ponds (Ponds 1 and 2). From the recirculation channels, about two dozen transfer pipes convey the primary effluent into the oxidations ponds, where biological processes (consumption of organic material by algae and bacteria) break down soluble organic material. In the process, oxygen is added to the water (reducing the biochemical oxygen demand of the effluent). Oxygen production in the oxidation ponds depends upon light available for algal photosynthesis. After treatment in the oxidation ponds (typically lasting up to 45 days), the water is pumped to the fixed growth reactors.

**Fixed Growth Reactors and Air Flotation Tanks System**

The function of the fixed growth reactors is to reduce the level of ammonia-nitrogen\(^4\) in the pond effluent. Constructed in 1975, the fixed growth reactors are tanks filled with plastic corrugated plates on which ammonia-consuming bacteria live. Ammonia-nitrogen is converted to nitrate-nitrogen\(^5\) in an aerobic microbial process. Next, the wastewater flows by gravity to the air flotation tanks. Polymers and air are injected into the wastewater to cause the algae and other particulate matter to coagulate and flocculate/bind, and rise to the top of the tank for easier removal. The flocculated algae is skimmed off the top and sent back to the oxidation ponds.

**Tertiary Treatment**

The goal of the third stage in the treatment process is to remove pollutants remaining after secondary treatment (ammonia, algae, and bacteria) and disinfect the water prior to discharge or reuse. Tertiary treatment at the WPCP results in water that is either clean enough to meet requirements for discharge to San Francisco Bay or for use as recycled water. The tertiary treatment system consists of filtration and disinfection.

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\(^4\) Ammonia-nitrogen describes the amount of molecular nitrogen in a system that is in either ammonia (NH\(_3\)) or ammonium (NH\(_4^+\)) form. NH\(_3\) is highly toxic to fish and other aquatic life.

\(^5\) Nitrate-nitrogen describes the amount of molecular nitrogen in a system that is in nitrate (NO\(_3^-\)) form.
Filtration

The air flotation process removes most of the algae. As a final polishing step, the wastewater is percolated through sand media filters. The filtration process removes most of the remaining algae and particulate matter. Periodically the filters are cleaned by backwashing water through the filters. Backwash water is returned to the oxidation ponds.

Disinfection

From the filters, the treated water flows to the chlorine contact tanks, where chlorine is added as a disinfectant. To meet the more stringent recycled water quality requirements, higher amounts of polymer (used in the secondary process) and chlorine (used in the disinfection process) are required. Finally, the fully treated effluent is discharged to the Bay through Moffett Channel or sent into the City’s recycled water system (some treated water is retained on site for reuse).

Recycled Water

Currently, approximately 10 percent of the daily flow from the WPCP (approximately 1.5 mgd) is treated in batches to higher standards for unrestricted non-potable uses and is pumped into to the City’s recycled water distribution system (City of Sunnyvale, 2013). Recycled water makes up approximately 7 percent (1,500 acre feet) of annual water supply in Sunnyvale (City of Sunnyvale, 2013). Recycled water is produced at the WPCP on an as-needed basis when required to meet instantaneous demand and/or to fill the San Lucar Recycled Water Storage Tank located offsite. The recycled water is used by businesses and the City of Sunnyvale for landscape and golf course irrigation, and decorative ponds. By 2035, the City projects a total recycled water demand of 3.6 mgd within Sunnyvale (City of Sunnyvale, 2013).

Solids Treatment

Digestion

Solids removed from the wastewater during primary treatment are pumped to four large cylindrical tanks called anaerobic digesters. In the oxygen-free environment maintained within the digesters, bacteria consume the organic matter in the sludge, a process that produces methane gas (CH₄), carbon dioxide (CO₂), stabilized organic solids, and water. The solids collected from the primary sedimentation tanks are sent to the primary digesters. Primary sludge is digested for 30 to 66 days, at about 95°F (the temperature at which anaerobic bacteria are most active). Heat for the digesters is provided by capturing the heat generated from the influent pump engines and engines in the Power Generation Facility. The methane gas produced in the digesters is used as a

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6 The standards for sources, uses, treatment, and other rules regarding recycled water are set forth in California Code of Regulations Title 22, Division 4, Chapter 3.
fuel for the WPCP’s engines and generators. The digestion system at the WPCP currently produces Class B\(^7\) biosolids\(^8\).

**Solids Dewatering and Disposal**

After the solids are processed in the digesters, they are spread across large filter tiles called sludge dewatering beds and dewatered.\(^9\) The water that drains from the solids is routed back to the oxidation ponds for further processing. Solids from the beds are removed and further solar dried on the paved area adjacent to the beds. Currently, sludge from Ponds 1 and 2 is also dewatered, separately, in mechanized dewatering units provided by a private operator. Each day (Monday through Friday) four to five truckloads of dewatered secondary sludge and digested biosolids are hauled from the WPCP, with occasional Saturday pickup to account for days with inclement weather. The dewatered sludge and Class B biosolids are normally hauled to one of seven available locations, including three land application programs (located in Solano, Merced, and Sacramento), three landfills (Newby Island, Kirby Canyon, and Potrero Hills), and one composting facility (Central Valley Compost Facility). A maximum of 20 dry tons is hauled offsite per day. Biosolids produced at the WPCP also have been landfilled at the seven acre Sunnyvale Biosolids Monofill, located southeast of the main plant site across Carl Road. The monofill, which has a capacity of 40,000 cubic yards, began operations in 1996 and continues to operate. It is designed to accept biosolids from the WPCP when market conditions or the characteristics of the biosolids make it difficult or expensive to take them elsewhere (City of Sunnyvale, 2011). Typically the monofill is used for disposal of digester solids from periodic digester cleaning.

**Support Systems and Facilities**

Other system facilities that support WPCP operations include the power supply, administration, and maintenance buildings. WPCP facilities are powered by electricity from two sources: the combined heat and power facility (also called the Power Generation Facility) and Pacific Gas and Electric Company (PG&E). Electricity is distributed throughout the main plant by feeder circuits connected to the main electrical feed switchgear.\(^10\) The power sources are connected to this switchgear.

**Power Generation Facility**

Under normal conditions the WPCP currently generates on site nearly all (94 percent) of the electricity required to operate plant facilities. The Power Generation Facility generates power using two gas-fueled engine generators. The generators burn a combination of landfill gas and digester gas (collectively referred to as “biogas”) and natural gas supplied by PG&E. When one

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\(^7\) Class B biosolids are biosolids processed to substantially reduce pathogen content, but to a lesser degree than Class A biosolids. As a result, Class B biosolids require special management considerations in order to limit human and animal exposure to the material if used for land application.

\(^8\) Biosolids are the organic solid product produced by wastewater treatment processes that can be beneficially reused.

\(^9\) The WPCP is transitioning to a contract dewatering operation as part of the Primary Treatment Facility project until a permanent dewatering facility can be constructed.

\(^10\) Switchgears are used to control, protect, and isolate electrical equipment by disconnecting the relevant equipment or circuit from the electrical supply.
or both generators are off-line for maintenance or repair, electricity purchased from PG&E is used to satisfy all or part of the WPCP’s electrical demand. In addition to generating electricity, waste heat is recovered from the generators for use in other plant processes, such as heating the digesters.

**Administration and Maintenance Buildings**

The existing administration building (shown on Figure 2-2) includes offices and workstations for WPCP staff. The existing maintenance building is adjacent to the Primary Control Building. Other workspaces, which are housed in portable buildings around the site, include the laboratory space, the instrumentation shop and mechanics offices, and the compliance inspection office. In total, approximately 16,000 square feet of space is used for administration, plant operations and maintenance, and laboratories.

### 2.2 WPCP Master Plan Process

The purpose of the proposed Master Plan is to provide a central planning document to guide improvements to the WPCP’s facilities and operations over the next 20 or more years (through the year 2035). The City of Sunnyvale began the initial stages of the master planning process in 2008, with a condition assessment of the major unit processes at the WPCP which identified the repair and replacement needs throughout the WPCP. The overall objective of this initial planning was to determine whether the City should rehabilitate the existing plant processes or invest in new facilities to fulfill the water treatment service commitments of the WPCP over the planning period. Changes to future regulatory requirements and expected demand for recycled water¹¹ drove the City to re-evaluate planning efforts starting in 2013; the City consequently updated planning objectives to reflect the new drivers resulting from these planning efforts. The Master Plan planning objectives are based upon five drivers:

- The need to maintain reliability of the WPCP and to replace facilities in order to ensure reliability;
- Changes to water quality, biosolids, and air emissions regulations;
- Changes in flows and loads to the WPCP;
- Policy decisions related to recycled water production and use; and
- WPCP operations and maintenance costs.

The Master Plan (and its predecessor, the Strategic Infrastructure Plan) identifies capital improvement projects (referred to herein as Master Plan improvements or components), estimates costs, and recommends implementation approaches to achieve the planning objectives. The Master Plan described in Chapter 3, *Project Description*, is the result of this planning process.

¹¹ The Master Plan incorporates recommendations from the City’s *Recycled Water System Master Plan*, completed in 2013.
2.3 Santa Clara Valley Water District Recycled Water Planning

As described in Chapter 5, Summary, and Chapter 1, Introduction, of this PEIR, the City is partnering with the Santa Clara Valley Water District (District) to propose the Water Purification Facilities (Water Purification Facilities) as a variation of the Master Plan. The Water Purification Facilities reflect current District water supply planning efforts, including the South Bay Water Recycling Strategic and Master Plan, which identify recycled and purified water sources as significant supply additions for Santa Clara County. Recently, the District initiated an Expedited Recycled and Purified Water Program, described below to provide the planning context for the Water Purification Facilities.

2.3.1 Expedited Recycled and Purified Water Program

The District is the largest water wholesaler in the Santa Clara Valley. In 2014, the Cities of San José, Santa Clara, Palo Alto and Mountain View, the South County Regional Wastewater Authority, and the City of Sunnyvale produced approximately 21,500 acre-feet per year of nonpotable recycled water. The District has developed the Expedited Recycled and Purified Water Program to provide, by 2035, capability for producing up to 72,000 acre-feet per year of nonpotable recycled water and purified water through partnerships with these agencies. The Program includes five priority projects that would generate the purified water, including implementation of the Water Purification Facilities for the purposes of Indirect Potable Reuse (IPR) in partnership with the City of Sunnyvale.

Preliminary Planning for Indirect Potable Reuse

Preliminary engineering studies for each of the five IPR projects are currently underway. Results of these studies would inform aspects of planning and design of the Water Purification Facilities described in this PEIR. The types of studies would include:

- **Feasibility Studies and Facilities Planning.** The feasibility studies and facility planning would include the evaluation of alternative facilities configurations, determination of rights-of-way and land purchase/lease requirements, and development of a facilities plan for at least one alternative for each project.

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12 South Bay Water Recycling (SBWR) is a water reuse program operated by the City of San José in partnership with other water agencies in Santa Clara County, including the District. The benefits of the program, along with the District’s interest in expanding the amount of recycled water used for water supply, led the District to partner with the City of San José to develop the SBWR Strategic and Master Plan, which evaluates the purpose and future use of recycled water produced by the San José-Santa Clara Regional Wastewater Facility. The SBWR Strategic and Master Plan evaluates near-term and long-term potable and non-potable reuse opportunities and alternatives for the water produced by the San José-Santa Clara Regional Wastewater Facility as well as identifying implementation plans and funding opportunities.
• **Reverse Osmosis**\(^{13}\) (RO) **Concentrate Management Studies.** If warranted based on the results of feasibility studies, the District will undertake RO concentrate management studies, including developing facility plans for RO concentrate conveyance and blending, alternative sizing and conceptual design for outfall/disposal options, and implementing a regulatory engagement plan for RO concentrate management.

• **Operational Studies.** Operational Studies include the modeling required to illustrate how the additional potable reuse facilities would be cost-effectively operated in conjunction with local and imported water deliveries and use of local storage for groundwater recharge and/or direct potable reuse.

• **Groundwater Studies.** Activities such as establishing test wells as needed, conducting monitoring and related studies for all IPR recharge areas, and undertaking groundwater modeling would be included in groundwater studies.

**Silicon Valley Advanced Water Purification Center**

In 2014 the District completed construction of the Silicon Valley Advanced Water Purification Center (SVAWPC), which provides advanced treatment (microfiltration, reverse osmosis, and ultraviolet light disinfection) of secondary effluent from the San José-Santa Clara Regional Wastewater Facility. The SVAWPC produces high quality purified water, removing trace organics and emerging constituents of concern as well as salts such as calcium and sodium. The purified water produced at the SVAWPC will be blended with the existing recycled water supply produced by South Bay Water Recycling program to enhance recycled water quality. In addition, SVAWPC is a pilot facility for development of potable reuse projects and includes a potable reuse demonstration testing plan, the goal of which is to confirm whether the purified water produced at the plant meets drinking water standards. Testing at the Plant will help inform planning and design of projects like the Sunnyvale Water Purification Facilities. The Testing began in fall 2014 and will be completed in early 2016. The objectives of the potable reuse demonstration testing are as follows:

• Demonstrate treatment performance in compliance with the Indirect Potable Reuse (IPR) standards of the California Department of Public Health (CDPH).

• Demonstrate treatment performance based upon potential future CDPH requirements for Direct Potable Reuse, including the efficacy of advanced oxidation alternatives.

• Examine treatment options to RO, providing high quality water for IPR spreading operations, while using less energy than RO.

• Use the performance data to educate staff, the Public, and regulators regarding the high quality water produced from the SVAWPC.

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\(^{13}\) Reverse osmosis is a water purification process that removes dissolved molecules from water by pressing water through a semipermeable membrane. Only select molecules (including water molecules) can pass through the membrane.
2.4 Other Projects at the WPCP

The City is currently designing or constructing several other projects at the WPCP that will be in place prior to implementation of the Master Plan, including the Primary Treatment Facility project, which will be constructed starting in 2016.\textsuperscript{14} The Primary Treatment Facility project includes construction of new preliminary and primary treatment facilities and related improvements at the site. Other ongoing WPCP improvements include reconstruction of two of the four anaerobic digesters, procurement of a portable standby generator which could be utilized on an as-needed emergency basis, and facility improvements associated with changing the source of chlorine used for disinfection from gaseous chlorine to sodium hypochlorite. The Primary Treatment Facility project along with the other ongoing WPCP improvements are described in greater detail in Chapter 6, \textit{Cumulative Impacts}.

2.5 References


\textsuperscript{14} The \textit{Sunnyvale Water Pollution Control Plant Primary Treatment Facility Project Initial Study/Mitigated Negative Declaration} (SCH Number 2014112037, available at City of Sunnyvale Department of Public Works, 456 West Olive Avenue, Sunnyvale CA 94086) was approved in May 2015.
CHAPTER 3
Project Description

Sections
3.1 Location
3.2 Need for the Project
  3.2.1 Aging Infrastructure and Operational Reliability
  3.2.2 Regulatory Requirements
  3.2.3 Projected Increases in Flows and Loads
  3.2.4 Policy Decisions
3.3 Project Objectives
3.4 Water Pollution Control Plant Improvements
  3.4.1 Overview of WPCP Improvements and Schedule
  3.4.2 Master Plan Phasing
  3.4.3 Secondary Treatment
  3.4.4 Tertiary Treatment and Water Recycling
  3.4.5 Biosolids
  3.4.6 Electrical and Combined Heat and Power
  3.4.7 Support Facilities and Related Actions
  3.4.8 Construction Characteristics
  3.4.9 Operating Characteristics
3.5 Water Purification Facilities
  3.5.1 Overview of Water Purification Facilities and Schedule
  3.5.2 Location of Water Purification Facilities
  3.5.3 Need for the Water Purification Facilities
  3.5.4 Objectives of the Water Purification Facilities
  3.5.5 Water Purification Processes at the WPCP
  3.5.6 RO Concentrate Management Planning
  3.5.7 Groundwater Replenishment Facilities
  3.5.8 Construction Characteristics of the WPF
  3.5.9 Operating Characteristics of the WPF
3.6 Uses of the PEIR
  3.6.1 Required Actions and Approvals
  3.6.2 Use of EIR in Approving Future Projects
3.7 References

Figures
3-1 Site Location Map
3-2 Sunnyvale Water Pollution Control Plant Area Map
3-3 Master Plan Area
3-4 Master Plan Implementation Schedule
3-5 Proposed Master Plan Layout
3-6 Proposed Secondary Treatment and Biosolids Processes
3-7 Rehabilitation of Existing Facilities
3-8 Proposed Uses for Oxidation Ponds
3-9 Proposed Tertiary Treatment Process
3-10 Other Facility Improvements
3-11 Water Purification Facilities Implementation Schedule
3-12 Potential District Groundwater Replenishment Facilities
3-13 Proposed WPCP Layout with Water Purification Facilities
3-14 Water Purification Facility Processes

Tables
3-1 Summary of Potential Regulatory Issues
3-2 2015 and 2035 Projected Wastewater Flows for the WPCP
3-3 Construction Equipment
3-4 Potential Review and Approval Actions by Other Agencies Following Completion of Project-Level CEQA
3.1 Location

The WPCP includes the main plant and two oxidation ponds\(^1\) (see Figures 3-1 and 3-2). The facility is adjacent to the southern end of San Francisco Bay (the Bay), approximately 0.8 miles north of Highway 237 and 1.5 miles north of Highway 101. Moffett Airfield is about 1.5 miles to the west. The main plant occupies an approximately 16.6-acre site at 1444 Borregas Avenue in Sunnyvale, Santa Clara County, and is accessed via Carl Road. The approximately 436 acres of oxidation ponds (Ponds 1 and 2) and associated recirculation channels are located along the Bay margin, as shown on Figure 3-2. Figure 3-3 depicts the boundaries of the project site, referred to herein as the Master Plan area, which consists of the areas where improvements and restoration described in the Master Plan would be implemented.

The Cargill Channel (part of the Don Edwards National Wildlife Refuge), Moffett Channel, Santa Clara Valley Water District (District) Pond A4 (referred to herein as SCVWD Pond A4), Guadalupe Slough, and the San Francisco Bay Trail also are adjacent to Ponds 1 and 2. The surrounding dry land area is primarily used for industrial and recreational purposes: the Sunnyvale Materials Recovery and Transfer Station (SMaRT Station\(^\circ\)) abuts the main plant to the east and the Sunnyvale Landfill (now closed and traversed by numerous trails) surrounds the main plant on the landward side (west, south, and east). A seven-acre biosolids monofill is located on the closed landfill south of the SMaRT Station. A short portion of the Bay Trail jogs inland just west of the main plant, with access provided via the western terminus of Carl Road. The Sunnyvale West Channel forms the main plant’s western boundary; the Sunnyvale East Channel borders the landfill farther east. These surface water drainages, managed by the District, discharge to Moffett Channel and/or the Guadalupe Slough and, ultimately, to the Bay. As shown in Figure 3-2, the Don Edwards National Wildlife Refuge, which encompasses portions of the South Bay Salt Ponds project\(^2\), surrounds Ponds 1 and 2 (including between Pond 2 and the main plant) and SCVWD Pond A4.

Refer to Section 3.5.2 regarding the location of proposed Water Purification Facilities.

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\(^1\) Oxidation ponds are bodies of wastewater where the growth of algae and microorganisms is promoted so these organisms consume solids and nutrients in the water.

\(^2\) The South Bay Salt Ponds Restoration project is an ongoing restoration of 15,100 acres acquired from Cargill, Inc., for the purpose of restoring tidal wetlands and other habitats, improving water quality, and reducing local flood risks. Former salt ponds surrounding the oxidation ponds and SCVWD Pond A4 are included within the South Bay Salt Ponds project.
LEGEND

- WPCP Property
- Sunnyvale City Boundary
- Don Edwards National Wildlife Refuge

Figure 3-2

Sunnyvale Water Pollution Control Plant Area Map

SOURCE: H.T. Harvey & Associates; adapted by ESA
Proposed for Restoration Following Decommissioning

Areas Proposed for Improvements Under the Master Plan

NOTE: Location and configuration of equalization and emergency storage is tentative and could change.

Figure 3-3
Master Plan Area

SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community; Carollo Engineers
3.2 Need for the Project

The Master Plan was developed to address several challenges facing the WPCP today and into the future, as well as to support City policies. This section describes some of the key challenges facing the WPCP.

3.2.1 Aging Infrastructure and Operational Reliability

Infrastructure must be periodically repaired or replaced due to wear or to meet new safety and technology standards. The WPCP, which has operated continuously since its construction in 1956, is one of the oldest treatment plants on the west coast. Condition assessments completed in 2009 evaluated the condition of the major processes at the WPCP and identified the need for repair and replacement of facilities and equipment throughout the WPCP. Aging facilities must be rehabilitated or replaced to ensure that the WPCP will reliably continue to meet health and safety and water quality standards.

3.2.2 Regulatory Requirements

The WPCP is subject to numerous federal and state regulations. Discharges from the WPCP are subject to discharge prohibitions, discharge limitations, and receiving water limitations. The California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region, regulates discharges into the San Francisco Bay through National Pollution Discharge Elimination System (NPDES) regulations of the Clean Water Act. The NPDES permit for the Sunnyvale WPCP (Permit number CA0037621) documents current practices and levels of service for attainment of discharge water quality that is protective of beneficial uses. Potential future changes in regulations will require changes in treatment processes at the WPCP. Table 3-1 identifies the primary regulatory drivers for proposed or potential upgrades to the WPCP.

3.2.3 Projected Increases in Flows and Loads

Table 3-2 presents existing and future (2035) wastewater flows for the WPCP. Projected increases in population and employment will result in higher average dry weather influent flows and peak wet weather flows in the future. Given the WPCP’s existing capacity, growth is not considered a primary driver for the Master Plan; however, the capacity of proposed treatment systems designed to meet anticipated future regulations account for projected increases in flows and loads.

3.2.4 Policy Decisions

Management decisions also drive many aspects of the Master Plan, including the following:

- **Energy.** When the advanced wastewater treatment facility is operational, the power required to keep the WPCP running would substantially increase. The City desires to become more energy neutral by decreasing purchases of natural gas from PG&E. Improvements are proposed to facilities associated with power generation, waste heat use, standby power, and power distribution at the WPCP to reduce reliance on purchased natural gas. This is further described below in Section 3.4.6.
### TABLE 3-1
**SUMMARY OF POTENTIAL REGULATORY ISSUES**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrients</td>
<td>Research has associated ammonia and other nutrients with disrupting the aquatic food chain. More stringent discharge limits for nitrogen (and potentially for phosphorus) are expected to be phased in during the Master Plan period.</td>
</tr>
<tr>
<td>Disinfection Byproducts(^a)</td>
<td>The current San Francisco Bay Basin Plan indicates that the RWQCB will establish water quality objectives for selected constituents of emerging concern as the necessary technical information becomes available, including for disinfection byproducts such as trihalomethanes (chloroform, bromoform, dichlorobromomethane, chlorodibromomethane). Current trihalomethane regulations (Clean Water Act) apply to wastewater discharged to the San Francisco Bay to protect the public from consumption of organisms exposed to the constituents.</td>
</tr>
<tr>
<td>Constituents(^b) of Emerging Concern</td>
<td>In the future, the RWQCB (or other agency) may regulate discharges for constituents of emerging concern such as endocrine disrupting chemicals (compounds that alter the normal functions of hormones). Regulation of constituents of emerging concern would necessitate additional treatment technologies at the WPCP.</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Changes in air quality regulations necessitate modification of existing energy equipment. Emissions reductions could provide opportunities to streamline future reporting requirements.</td>
</tr>
<tr>
<td>Standby Power</td>
<td>Currently the WPCP has limited standby power capabilities. Proposed facilities will require standby power to ensure continuous operations, consistent with adopted standards.</td>
</tr>
<tr>
<td>Biosolids</td>
<td>As landfill disposal of biosolids becomes more restrictive, the City must diversify its options for disposing of or beneficially reusing biosolids.</td>
</tr>
</tbody>
</table>

\(^a\) Disinfection byproducts form when disinfectants used to treat water react with organic matter or other constituents. All strong oxidants (including chlorine, chlorine dioxide, and ozone) produce disinfection byproducts, which have been linked with adverse health effects.

### TABLE 3-2
**2015 AND 2035 PROJECTED WASTEWATER FLOWS FOR THE WPCP (MGD)**

<table>
<thead>
<tr>
<th>Project Flows</th>
<th>Permitted Flows</th>
<th>2015</th>
<th>2035(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Dry Weather Effluent Flow(^b)</td>
<td>29.5</td>
<td>14.5</td>
<td>19.5</td>
</tr>
<tr>
<td>Peak Wet Weather Flow(^c)</td>
<td>40</td>
<td>29.7</td>
<td>40.0</td>
</tr>
<tr>
<td>Peak Hour Wet Weather Flow(^d)</td>
<td>N/A</td>
<td>43.4</td>
<td>58.5</td>
</tr>
<tr>
<td>Average Daily Annual Flow(^e)</td>
<td>N/A</td>
<td>15.2</td>
<td>20.4</td>
</tr>
<tr>
<td>Recycled Water Production(^f)</td>
<td>N/A</td>
<td>1.3</td>
<td>3.6</td>
</tr>
<tr>
<td>Average Dry Weather Effluent Flow(^g)</td>
<td>N/A</td>
<td>13.2</td>
<td>15.9</td>
</tr>
</tbody>
</table>

N/A – Not applicable

\(^a\) Flows were calculated using historical flows and peaking factors from 2000-2012, and anticipated community growth.

\(^b\) The ADWF period is set for each year as the three-month period between June and September that produces the minimum flow. The ADWF is the average of the average daily flow during this three-month period.

\(^c\) Peak Wet Weather Flow is the maximum average daily flow during a given year.

\(^d\) Peak Hour Wet Weather Flow is the peak hour flow resulting from a rainfall event and is used as the basis for setting the WPCP’s hydraulic capacity and sizing improvements.

\(^e\) The average annual flow is the average of the average daily flow for each calendar year.

\(^f\) Estimates for recycled water use are based on goals identified in the City of Sunnyvale Recycled Water Master Plan and Feasibility Study.

\(^g\) Future effluent flow is estimated based on average dry weather influent flow less recycled water. This estimate does not account for evaporation from the oxidation ponds.

3. Project Description

- **Recycled Water.** The City plans to increase recycled water supplies, serve additional customers, and produce higher quality recycled water. This may include microfiltration improvements for the production of recycled water for potential high-end industrial uses and to meet long-term recycled water demand. Having the capability to provide microfiltered recycled water would provide the City more flexibility in supplying certain customers. This is further described below in Section 3.4.4.

- **Management Efficiency.** The City also proposes to consolidate the Administration, Outreach, Laboratory, Compliance Inspection and Operations/Control functions into a single building to increase efficiency, accommodate future staff, maximize shared use space, and minimize building space requirements. Consolidation of the Maintenance Shop, Storage and Maintenance staff facilities with a new warehouse is proposed as well for efficiency and inventory control. This is further described below in Section 3.4.7.

3.3 Project Objectives

The City established overall planning objectives for the WPCP Master Plan in 2013. These planning objectives include:

- Develop process improvements to meet current and foreseeable water quality, biosolids, and air quality requirements.

- Identify process improvements that are cost effective, incorporate innovative solutions and technologies, and promote City goals to maximize water recycling opportunities.

- Provide the WPCP with a more reliable power supply through renewable energy generation that provides means to meet future heat and power demands.

- Maximize the use of available space, enhance safety through improved traffic circulation and access, and improve public access to the WPCP while ensuring site security.

- Maintain wastewater operations to meet regulatory standards during the course of implementing the Master Plan improvements.

- Provide flexibility in responding to financial and regulatory uncertainty.

- Maximize the useful life of the existing WPCP facilities in a manner that minimizes rate impacts while maintaining regulatory compliance.

- Incorporate a level of redundancy which provides operations and maintenance flexibility to deal with planned and unplanned process downtime.

- In partnership with other agencies, protect the WPCP from flooding and risks associated with sea level rise.

- Minimize life-cycle costs (capital and operation and maintenance) to City rate payers.
3.4 Water Pollution Control Plant Improvements

3.4.1 Overview of WPCP Improvements and Schedule

The Master Plan includes improvements to the WPCP’s major process areas over the next 20-plus years (to 2035). Figure 3-4 identifies the major improvements planned and their implementation schedule. Figure 3-5 depicts the site plan for the main plant area at build-out. Schedule, site layout, and other details presented herein may change as planning of individual improvements progresses into design.

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</thead>
<tbody>
<tr>
<td>Secondary</td>
<td>Rehabilitation of Existing Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Split Flow Conventional Activated Sludge</td>
<td></td>
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<tr>
<td></td>
<td>Air Flotation Tank Pump Station, Pipeline</td>
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<tr>
<td></td>
<td>Conventional Activated Sludge</td>
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<tr>
<td></td>
<td>Diurnal Equalization, Emergency Storage</td>
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<td>Chemical Phosphorus Removal</td>
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<td></td>
<td>Decommissioning of Ponds 1 and 2</td>
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<tr>
<td>Tertiary</td>
<td>Rehabilitation of Existing Facilities</td>
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<td></td>
<td>Filter Control Building</td>
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<tr>
<td></td>
<td>Chloramine Disinfection</td>
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<tr>
<td></td>
<td>Filter Backwash Storage</td>
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<td></td>
<td>Denitrification Filters</td>
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<tr>
<td></td>
<td>Microfiltration</td>
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<td></td>
<td>Ultraviolet Disinfection</td>
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<tr>
<td>Solids</td>
<td>Thickening/Dewatering (Stage 1)</td>
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<td>Digester No. 5</td>
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<td></td>
<td>Fats, Oils, and Grease Facility</td>
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<tr>
<td></td>
<td>Thickening/Dewatering (Stage 2)</td>
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<td></td>
<td>Biosolids Post-processing</td>
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<td></td>
<td>Phosphorus Recovery (Struvite)</td>
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<tr>
<td>Energy</td>
<td>Power Generation Building</td>
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<tr>
<td>Support</td>
<td>Bay Trail Access Relocation</td>
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<td></td>
<td>Administration Building</td>
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<td></td>
<td>Tidal Flood Protection</td>
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<tr>
<td></td>
<td>Maintenance Building</td>
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</table>

Figure 3-4: Master Plan Implementation Schedule

3.4.2 Master Plan Phasing

The relatively small size of the main plant area and the need to maintain continuous operations 24 hours per day, seven days per week, largely determines the phasing of Master Plan implementation. Some existing facilities must be decommissioned and demolished to create space for construction of new facilities, and no more than two large contractors can work on the site simultaneously. Other factors that determine the overall proposed schedule include cost, the timing of future regulations (such as new discharge requirements for nutrient removal), and projected increases in flows and loads. As described in Section 3.4.3, the proposed staging of improvements to secondary treatment would involve transitioning to a conventional activated sludge treatment process and operating existing and proposed treatment trains in parallel for about 10 years.
Proposed Master Plan Layout

Figure 3-5

Facilities Planned for Construction in 2016-2019

Source: ESA, Carollo Engineers

NOTE: Layout depicts buildout of Master Plan at the main plant site. For Split Flow Process, aeration basins, secondary clarifiers, and related structures would be implemented in stages.

CEPT - Chemically Enhanced Primary Treatment
FOG - Fat, Oil, Grease
ML - Mixed Liquor (effluent from aeration basins)
PE - Primary Effluent
RAS - Return Activated Sludge
SE - Secondary Effluent
T/S - Transformer/Switchgear

For proposed changes to Oxidation Ponds, see Figures 3-7 and 3-8.
3.4.3 Secondary Treatment

Conversion to Conventional Activated Sludge

For secondary treatment, the Master Plan calls for a conventional activated sludge\(^3\) process, which would eventually replace the oxidation ponds, fixed growth reactors, and the air flotation tanks that make up the current secondary system. Conventional activated sludge would provide the treatment needs to help accommodate future regulatory limits for nitrogen, and in combination with the chemically enhanced primary treatment/chemical dosing at the filters, would help accommodate future regulatory limits for phosphorus.

Stages of Secondary Treatment Process Improvements

Elements of the existing secondary treatment process need to be rehabilitated in the near term to ensure continued reliable treatment until the entire secondary treatment process is replaced with a conventional activated sludge process. The anticipation of future regulations for nutrient removal is a primary driver for the proposed conversion to conventional activated sludge, which will likely be phased in over a number of years. The City proposes to stage replacement of secondary treatment facilities by using a “Split Flow” configuration (Stage 1) prior to full conversion to conventional activated sludge treatment (Stage 2). Implementing the Split Flow configuration would provide the City more flexibility in dealing with regulatory uncertainties and cash flow. During the first stage, the City would build a smaller conventional activated sludge facility and continue to use the existing secondary treatment process (oxidation ponds, fixed growth reactors and air flotation tanks) to treat a portion of the flow, splitting the flow between the existing and new secondary treatment processes. Ultimately, the City would fully replace the existing secondary treatment process with the conventional activated sludge process by the end of the Master Plan period.

Figure 3-6 presents the secondary treatment process flow schematic under Split Flow and full Conventional Activated Sludge scenarios.

Rehabilitation of Existing Facilities

Several facilities associated with operation of the oxidation ponds require rehabilitation by 2020 (see Figure 3-7). These include: rehabilitating the existing 60-inch primary effluent pipeline from the main plant to Pond 2; rehabilitating the existing 36-inch pipeline from the oxidation ponds to the fixed growth reactor distribution structure; replacing an electrical substation and ancillary equipment for the pond recirculation pump station; constructing a new pond effluent pump station.

---

\(^3\) The conventional activated sludge process is a commonly used method to remove the soluble/non-settleable organic solids from primary effluent with the assistance of microorganisms. The microorganisms consume the organics, grow additional microorganisms, and then are settled out of the water after a certain amount of time. This is achieved through a two-stage process. First, oxygen is bubbled through primary effluent in an aeration tank to encourage microbial growth. Then the liquids in the aeration tank are transferred to secondary clarifiers, where the microbial solids settle by gravity and are separated from the treated water. Pump stations adjacent to the secondary clarifiers pump a portion of the microbial solids collected from the secondary clarifier back to the aeration tank to seed additional microbial activity; these microbial solids are called “return activated sludge.” In order to maintain the correct balance of microorganisms in the aeration tank, the remaining microbial solids from the clarifier, collectively called “waste activated sludge,” are sent to the digesters.
Secondary Treatment with Split Flow Process (to be implemented by 2025)

- Primary Effluent ≤17.8 mgd
- 4 mgd minimum
- Oxidation Ponds
- Fixed Growth Reactors
- Air Flotation Tanks
- Algae solids
- Thickening
- Dewatering
- Land Application/Alternative Daily Cover/Future Beneficial Use

1 Changes to pond operations during this phase limited by pumping capacity.

Secondary Treatment with Full Conventional Activated Sludge Process (to be implemented by 2035)

- Primary Effluent 19.5 mgd
- > 34.7 mgd
- Equalization Tanks, Emergency Storage
- Return flow to Aeration Basins
- Thickening
- Dewatering
- Land Application/Alternative Daily Cover/Future Beneficial Use

2 Projected 2035 average dry weather flow per Master Plan Flow and Loads Evaluation Technical Memorandum. Aeration basins have capacity to treat up to 34.7 mgd.

SOURCE: ESA, Carollo Engineers

Proposed Secondary Treatment and Biosolids Processes
Rehabilitate Fixed Growth Reactors
Rehabilitate Air Flotation Tanks
Retrofit Chlorine Contact Tanks
Replace Pond Effluent Pump Station
Retrofit Pond Effluent Pipeline

Figure 3-7
Rehabilitation of Existing Facilities

SOURCE: ESA; Google Maps
and decommissioning and demolishing the existing one; and replacing the existing boom used to collect debris upstream of the pond effluent pump station with a more accessible screening device. Rehabilitation of the existing primary effluent pipeline would include either sliplining or placing cure-in-place pipe within the existing pipeline. As sliplining would require a more extensive footprint, this PEIR conservatively assumes that the rehabilitation would be conducted by sliplining the existing pipeline. Within the main plant, equipment inside the fixed growth reactors and pipes and pumps associated with the fixed growth reactors would also be replaced or rehabilitated. Equipment upgrades would also be made to the four of the existing air flotation tanks (e.g., structural rehabilitation of the tank effluent channel, coating of concrete structures, and replacement of float collection pumps). Prior to construction of the Conventional Activated Sludge with Split Flow Process, described below, the existing primary sedimentation tanks would be demolished to create room on the site for the secondary clarifiers.

**Conventional Activated Sludge with Split Flow Process**

The Split Flow facilities (expected to be in service around 2024) would be operated in parallel with the existing secondary treatment system (e.g., the ponds, fixed growth reactors, and air flotation tanks). The major elements of the Split Flow stage include two aeration basins, a blower building and aeration blowers, three secondary clarifiers, two return activated sludge/waste activated sludge pump stations, and a primary effluent distribution structure (these facilities are shown on the site plan presented in Figure 3-5). Under the Split Flow configuration, the new conventional activated sludge secondary treatment process would treat up to 17.8 mgd of the influent flow. The existing secondary treatment system would treat flows in excess of 17.8 mgd. WPCP operators would maintain a minimum flow of ±4 mgd to the oxidation ponds to maintain a viable microbial population.

In addition to the conventional activated sludge facilities listed above, the Split Flow stage would include construction of a new air flotation tank pump station just north of the secondary clarifiers and a 21-inch diameter pipeline along the northern and eastern boundaries of the main plant site from the new pump station to the primary effluent distribution structure. These facilities would allow a portion of the oxidation pond effluent that currently flows to the air flotation tanks to be pumped to the aeration basins for treatment.

The existing Chemical Mixing and Compressor Building would continue operation as storage for chemicals and blowers used in the air flotation tanks and dual media filters.

**Chemical Phosphorus Removal**

To meet anticipated future total phosphorus limitations, the Master Plan includes provisions for phosphorus removal from treated effluent by either of two processes. If Sunnyvale chooses to remove phosphorus using chemical dosing, a Chemical Phosphorous Removal Facility (identified as “Chem Dosing” on Figure 3-5) would be constructed near the filters once the full conventional activated sludge plant is in operation. The Chemical Phosphorous Removal facility would include a chemical storage tank and associated pipes. Either ferric chloride or aluminum potassium sulfate would be added to the treated water at the filters. Sunnyvale may alternatively implement
phosphorus removal using a biological approach, which could result in the construction of a Phosphorus Recovery Facility (if deemed cost effective), described further below in Section 3.4.5.

**Conversion to Full Conventional Activated Sludge**

The full Conventional Activated Sludge facilities would fully replace the existing secondary treatment system with conventional activated sludge and would involve construction of additional facilities within the main plant site as well as construction of diurnal equalization and emergency storage facilities, as described below.

**Facilities Within Main Plant**

Additional elements to be constructed within the main plant during the transition to full Conventional Activated Sludge include two aeration basins, aeration blowers, three secondary clarifiers, one return activated sludge/waste activated sludge pump station and demolition of the existing air flotation tanks. In addition, the City would reserve site space for a possible fifth aeration basin (that may be needed based on future ammonia loads) and denitrification filters (to meet possible future total nitrogen limits of 3 mg/L). These facilities are shown on the site plan presented in Figure 3-5.

**Diurnal Equalization and Emergency Storage**

Currently, the oxidation ponds provide a “wide spot” in the treatment process, which helps WPCP operators modulate peak flows and provides storage of flow during unexpected plant emergencies. With the implementation of full Conventional Activated Sludge (estimated to occur between 2030 and 2035), the ponds would no longer be used for secondary treatment. Conversion to full conventional activated sludge must accommodate projected peak diurnal flows, which would require eight million gallons of storage for diurnal equalization of primary effluent. In addition, it was determined that three days of primary effluent storage would be required for plant emergency needs. The specific site for diurnal equalization and emergency storage is undetermined, but could be somewhere within the existing oxidation ponds. **Figure 3-8** depicts a conceptual layout for these facilities in Pond 1 evaluated in this PEIR. Primary effluent would be diverted to the equalization tanks when diurnal flows into secondary treatment exceed approximately 34.7 mgd. Implementation of diurnal equalization and emergency storage would coincide with Stage 2 of secondary treatment process improvements and would include: removal of sludge from the ponds; improvements to the existing access road to the ponds (including raising the elevation of the road by approximately 5-6 feet); improvements to fortify and raise the existing berms and site area to approximately 16 feet above sea level to accommodate sea level rise; concrete equalization tanks for diurnal equalization storage; earthen storage basins for emergency storage; an equalization pump station to return flows to the secondary treatment process; a new section of pipeline to connect the existing primary effluent pipeline (from current discharge location in the recirculation channel) to the equalization tanks; and a plant water supply pipeline for washdown uses.

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4 The diurnal equalization facilities would temporarily hold peak flows before slowly pumping the flows to the secondary treatment facilities for treatment.
Decommissioning of Ponds 1 and 2

Once the full Conventional Activated Sludge facilities are completed and operational, the oxidation ponds would be decommissioned (after 2035). The City proposes to explore opportunities to implement habitat restoration within the remaining area of the oxidation pond facilities, in partnership with regulatory and other agencies. Restoration could include planned breaches of the pond levees and re-grading and re-vegetation of the ponds. Active restoration of the ponds could provide the potential for wetland mitigation banking opportunities. Habitat restoration would need to occur in association with the provision of flood protection for the WPCP, however, because the ponds would be breached as part of the restoration. When the ponds are breached, the marginal flood protection provided to the WPCP by the levees surrounding the ponds would be lost. As described in the Master Plan, the ponds could be evaluated for inclusion in the South San Francisco Bay Shoreline Study and/or the South Bay Salt Pond Restoration Project, both projects designed to manage flood risk in South San Francisco Bay. Coordination with regional agencies to identify and address coastal flood hazards as well as the impacts of restoration (addressed generally in this PEIR) would be required. Flood protection measures at the WPCP are described below in Section 3.4.7. Figure 3-8 indicates areas potentially available for restoration.

3.4.4 Tertiary Treatment and Water Recycling

Figure 3-9 presents the tertiary treatment process flow schematic for Split Flow and for full Conventional Activated Sludge processes, and indicates existing filtration and disinfection facilities to be rehabilitated, new facilities to be implemented and potential future facilities that may be implemented depending on future regulations and policy decisions regarding recycled water production.

Filtration

Filtration facilities to be rehabilitated or upgraded with Master Plan implementation include the dual media filters and the filter control building. Additionally, a new filter backwash storage facility would be constructed once full conventional activated sludge secondary treatment is operational. Depending on future limits for nitrogen, denitrification filters may also be constructed at the WPCP in the future.

Filter Upgrades

Upgrades would be made to the dual media filters to keep them operational through the Master Plan period (to 2035). Prior to operation of full conventional activated sludge secondary treatment, the City would implement upgrades that would enable the WPCP to continuously produce Title 22 disinfected tertiary recycled water\(^5\) (instead of the current batch production). Then, with operation of full conventional activated sludge secondary treatment the filter media, along with associated pumps, mechanical equipment, piping, and other plumbing structures, would be replaced.

\(^5\) The standards for sources, uses, treatment, and other rules regarding recycled water are set forth in California Code of Regulations Title 22, Division 4, Chapter 3.
Figure 3-8

Proposed Uses for Oxidation Ponds

Proposed for Restoration Following Decommissioning

NOTE: Location and configuration of equalization and emergency storage is preliminary and could change.

SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community; Carollo Engineers
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Tertiary Treatment With Split Flow Process (to be implemented by 2025)

- Secondary Effluent
  - Filters
  - Chlorine Disinfection
    - Filter Backwash
    - Oxidation Ponds
      - Return through secondary treatment process

1 Changes to pond operations during this phase limited by pumping capacity.

Tertiary Treatment With Full Conventional Activated Sludge Process (to be implemented by 2035)

- Secondary Effluent
  - Filters
  - Chlorine Disinfection or Ultraviolet Disinfection
    - Filter Backwash
    - Ozone Oxidation
    - Micro Filtration Facility
      - < 3.6 mgd
    - To primary sedimentation tanks when influent flow is low

2 Projected long-term peak recycled water demand.

SOURCE: ESA, Carollo Engineers

Figure 3-9
Proposed Tertiary Treatment Process
**Denitrification Filters**

If regulations limiting the amount of nitrogen allowed in WPCP effluent become stricter (3 mg/L), the WPCP may need to install Denitrification Filters to meet the new effluent limit requirements. Denitrification Filters can also perform the same function as the existing dual media filters, in addition to removing sufficient amounts of nitrogen from the effluent to meet more stringent future regulations, and would replace the dual media filters. The Denitrification Filters facility would include the filters contained in concrete tanks, backwash air and water systems, and a methanol storage and feed system.

**Filter Backwash Storage**

Filter backwash flows from the existing dual media filters currently flow to the oxidation ponds. New filter backwash storage facilities located on the main plant site would be required when the oxidation ponds are decommissioned. The new filter backwash storage facilities would include a storage tank and pump station. The pump station would pump the backwash flows from the storage tank to the primary sedimentation tanks for treatment. This component would be implemented after the full conventional activated sludge secondary treatment process is operational.

**Filter Control Building**

A new Filter Control Building and associated facilities (including updated electrical equipment and instrumentation controls) would be constructed following completion of the proposed Administration Building. With the new Administration Building in place, the existing combined Filter Control/Laboratory facility would then be decommissioned and demolished.

**Microfiltration**

The City is projecting a near-term (2018) demand for recycled water of about 1.7 mgd and a long-term (2035) demand of about 3.6 mgd (City of Sunnyvale, 2013). A portion of this increased demand could come from industrial users if water quality issues are addressed. The City is considering implementation of a 3.0 mgd microfiltration facility at the WPCP to meet a portion of the projected demand for higher quality recycled water, providing the City with the ability to produce recycled water for potential high-end industrial uses. Microfiltration is a membrane-based low-pressure separation process that typically employs hollow fiber membranes to provide a barrier to the passage of solids (such as turbidity and suspended solids) and microorganisms (such as bacteria, pathogens and some viruses). This would include a new building on the plant site to contain the facility, as well as pumps, piping, and related support equipment. If implemented, the microfiltration facility would be constructed at the current location of the fixed growth reactors and air floatation tanks following decommissioning and demolition of these facilities.
Disinfection

Upgrades to disinfection infrastructure, as well as construction of new disinfection facilities, depend on the secondary treatment process used as well as regulatory requirements governing levels of certain constituents in WPCP discharge.

Rehabilitation of Existing Facilities

The existing chlorine contact tanks would be rehabilitated along with the other WPCP rehabilitation upgrades to support Split Flow implementation and to keep them operational until they are fully replaced by another disinfection facility (refer to Figure 3-7). The rehabilitation upgrades proposed include seismic retrofits, coating of the tanks, repairs to concrete channels between facilities, and replacement of existing mechanical equipment and instrumentation. The Master Plan also proposes a new discharge monitoring station to increase accuracy of measurements of chlorine present in the WPCP discharge.

Chloramine or Ultraviolet Disinfection

Conversion to conventional activated sludge with chlorine disinfection has the potential to increase the amount of trihalomethanes (THMs) in the WPCP effluent. To meet future THM regulations, the existing disinfection process would be replaced with chloramine or ultraviolet (UV) disinfection. If Split Flow operation is implemented, transition to a chloramine disinfection system would not be required. The existing chlorine disinfection system would remain in place until the Split Flow operation is discontinued, at which time UV disinfection would replace the existing chlorine disinfection system. Without the Split Flow stage, chloramine disinfection would be implemented and continue until either limits on the release of THM become more stringent or the ammonia addition required for chloramine disinfection becomes operationally infeasible. When either limit is reached, UV disinfection would be implemented. If chloramine disinfection is implemented, a tank for aqueous ammonia storage and associated piping would be installed to deliver ammonia to the chlorine contact tanks. It is assumed the existing disinfection process would need to be modified by 2029 and replaced with an alternative disinfection process by 2033 to comply with the anticipated THM regulations.

Replacement of either the existing chlorine disinfection system or a chloramine disinfection system with UV disinfection would include demolition of the existing fixed growth reactors and air flotation tanks (if demolition has not already occurred by the time UV disinfection is implemented), construction of concrete channels, installation of UV lamps and flow control structures in the concrete channels, and a canopy to cover the concrete channels.

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6 Trihalomethanes are chemical byproducts of the disinfection process that have been linked to adverse health effects. Trihalomethanes form when organic matter in water reacts with chlorine.

7 Ultraviolet disinfection is a physical (rather than chemical) process used to inactivate or destroy pathogenic organisms. Ultraviolet disinfection systems transfer electromagnetic energy from a mercury arc lamp to an organism’s genetic material, thereby destroying a cell’s ability to reproduce.
Ozone Disinfection

In addition to the previously mentioned disinfection systems, if the State Water Resources Control Board implements limits for constituents of emerging concern\(^8\), an ozone disinfection facility may be required. Ozonation is a disinfection process that uses ozone gas to inactivate or destroy pathogenic organisms and to oxidize odor-causing compounds. Ozonation systems generate ozone from a feed gas (air or liquid oxygen) and feed the ozone into a contact chamber. In the chamber, ozone and its decomposition products oxidize/destroy the cellular material of pathogenic organisms and odor-causing compounds. The off-gases from the contact chamber are treated to destroy residual ozone before release into the atmosphere. The facility would operate in conjunction with either chlorine disinfection or UV disinfection. The regulatory requirements that would motivate the implementation of this facility are not expected until late in the Master Plan period (around 2035).

3.4.5 Biosolids

The biosolids facilities to be built at the WPCP would accommodate the 2035 maximum month load of solids generated by the primary and secondary processes.

Thickening and Dewatering

The new Thickening/Dewatering Facility would be sited at the location of the current Primary Control Building. The Thickening/Dewatering Building would house equipment to thicken waste activated sludge and dewater digested biosolids, and would be implemented in two stages. The initial stage of thickening and dewatering facilities would be required for solids treatment concurrent with implementation of the initial stage of the conventional activated sludge process (the Split Flow stage). The second stage of implementation would support the conversion from Split Flow to full conventional activated sludge. Other improvements planned to coincide with the implementation of the new Thickening/Dewatering Facility include rehabilitating aging elements of existing digester support facilities and upgrading the existing digester support facilities to include separate primary sludge and waste activated sludge feed systems.

Primary sludge would be thickened in the primary sedimentation tanks (to be constructed in 2016 as part of the Primary Treatment Facility Project identified in Section 2.4), while waste activated sludge would be thickened with new rotary drum thickeners. The rotary drum thickeners would be located in the proposed Thickening/Dewatering Facility and would operate 24 hours per day, seven days per week.

New equipment (such as screw presses) would be used for sludge dewatering and would be co-located with the thickening elements inside the new Thickening/Dewatering Building. The dewatering equipment within the Thickening/Dewatering Building would operate 24 hours per day, five days per week. The new thickening and dewatering operation would also include a digested sludge storage tank and dewatered cake conveyance, cake storage, and truck loading.

\(^8\) Chemicals in water that may pose a risk to human health and the environment but the presence, frequency of occurrence, or source of which may not be fully known.
facilities. Currently the City plans to implement a bioscrubber system to treat odors from the solids handling facilities. A bioscrubber system consists of a vertical tower of synthetic media which hosts organisms that remove odorous compounds from air. Bioscrubbers do not require chemical use. Exhaust fans and ventilation would be installed in the new Thickening/Dewatering Building to extract enough air from the building to prevent fugitive emissions and provide sufficient air changes required for worker safety.

**Digestion**

The existing digestion process would continue to operate and would expand as needed to provide adequate process reliability and efficiency and to accommodate future sludge flows. Three of the existing digesters at the WPCP have been structurally modified and rehabilitated. The rehabilitation of the fourth existing digester is scheduled to be completed in 2016. With the implementation of conventional activated sludge for secondary treatment, the amount of waste activated sludge generated at the WPCP would increase. In order to provide sufficient volume to digest the additional waste activated sludge, a fifth 1.0 million gallon digester would be constructed.

Digested sludge would be sent directly to the thickening and dewatering facility where it would be dewatered before being discharged to a truck trailer. At buildout, approximately 100 cubic yards of biosolids would be generated daily, the removal of which would require approximately 15 truck trips per week.

**Phosphorus Recovery**

To meet anticipated future (by 2035) limits on total phosphorus in WPCP effluent, the Master Plan includes provisions for phosphorus removal by one of two processes. Phosphorus removal by chemical dosing is described above under “Chemical Phosphorus Removal” in Section 3.4.3. The alternative to chemical dosing is removal of phosphorus by biological processes during secondary treatment. Biological phosphorus removal results in greater release of phosphorus from the microorganisms during secondary treatment. The phosphorus then can react with other ions present in water during secondary treatment to form struvite, which precipitates out of the water onto the walls of the digester, pumps, and pipes. The buildup of struvite decreases the efficiency of the WPCP over time. Additionally, when water drained from digested biosolids is routed back through the WPCP for treatment, the phosphorus that has not already precipitated would have to be removed again. To control the growth of struvite, a Phosphorus Recovery Facility could be constructed (if cost effective) to harvest the phosphorus from water drained from digested biosolids prior to routing the water back to the Primary Treatment Facility. The Phosphorus Recovery Facility would include a building to house the mechanical and chemical systems used to collect and bag the struvite, along with storage for the treated water prior to return to the primary treatment facility.

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9 During conventional activated sludge secondary treatment, the wastewater would be exposed to anaerobic conditions, in which bacteria that incorporate relatively high levels of phosphorus into their cells preferentially grow prior to routing to the aeration basins. The waste activated sludge collected from the secondary clarifiers would contain relatively higher levels of phosphorus as a result.
**Fats, Oils, and Grease (FOG) / Food Waste Facility**

The City anticipates there would be enough digester capacity during the Master Plan period to treat FOG waste collected within the City of Sunnyvale. Digesting fats, oils, and grease, in addition to other liquid (emulsified) food wastes, can increase digester gas production. Additional gas produced by the digesters would be used to produce electricity for the WPCP. Based on estimated FOG waste collection of 3,000 gallons per day in 2035, the proposed digester facilities would accommodate this additional material. To capture this potential energy stream, a FOG and food waste storage facility and related equipment and facilities would be constructed between 2025 and 2030. FOG waste would be pumped from the FOG facility to the digesters.

**Biosolids Post-Processing**

The cost and availability of biosolids disposal alternatives in the future could require the City to further reduce the volume of solids produced at the WPCP. Based on future biosolids disposal needs, a thermal drying facility operating 24 hours per day, five days per week may be constructed in the future.

**3.4.6 Electrical and Combined Heat and Power**

**Energy Upgrades**

As described in Chapter 2, Project Background, the WPCP currently generates nearly all of the energy required to operate plant facilities with gas from the digesters and the surrounding landfills. Once the advanced wastewater treatment facility becomes fully operational the power required to keep the WPCP running will nearly triple, yet gas from the adjacent closed landfill will continue to decline. The City would implement the FOG/food waste program to enhance biogas production in the digesters and also purchase electricity from PG&E to meet future power demand. In addition, a new standby power facility would be implemented. Improvements are proposed to facilities associated with power generation, waste heat use, standby power, and power distribution at the WPCP. Average power demand at the WPCP in 2035 would be approximately 3,100 kilowatts (kW), amounting to an annual energy demand of 27,150 megawatt hours (MWh) per year.

**Power Generation Facility and Support Buildings**

The existing power generation facility would be refurbished, including installation of two new 800 kW power generation engines, replacement of controls and heat recovery equipment, installation of new piping, and structural and architectural modifications to the power generation building.

**Standby Generators**

The City is currently installing a standby diesel generator as part of the Primary Treatment Facility Project to be used to maintain WPCP operations in the case of a power outage. The City would install a second diesel generator (up to 2,500 kW), housed in a weatherproof enclosure,
and two aboveground fuel storage tanks (up to 5,000 gallons each) concurrent with proposed secondary treatment facilities.

**Electrical Distribution System**

The existing 4,160-volt electrical distribution system would be replaced with a 12-kilovolt electrical distribution system, due to the age and condition of the existing system. The 12-kilovolt distribution system would be implemented in two stages (the first stage with the primary improvements and the second stage with the secondary treatment improvements).

**Energy Demand**

The anticipated total energy demand for the WPCP at buildout is approximately 3,100 kW. A combination of energy produced onsite and electricity purchased from PG&E would support the WPCP. While landfill gas is projected to decline by 2035, the amount of digester gas from biosolids and from the FOG facility would increase, increasing the power produced onsite to approximately 1,000 kW. The remaining power needed to run the WPCP would be purchased as electricity from PG&E.

**3.4.7 Support Facilities and Related Actions**

The Master Plan also includes improvements to other onsite and offsite facilities, described below and shown on Figure 3-10.

**Closure of Carl Road and Relocation of Public Access to Bay Trail**

The City proposes to close Carl Road to public access west of Borregas Avenue and relocate access to the San Francisco Bay Trail in order to accommodate the proposed improvements to the WPCP and ensure site security. Recreationists would instead access the Bay Trail and other neighboring trails via an enhanced access point along Caribbean Drive at the West Channel (see Figure 3-10 for general location). Proposed upgrades include converting 950 feet of one lane of Caribbean Drive to the east and west of the access location to parking in combination with grading, sidewalk, and landscaping improvements. The enhancements to the trail access would occur following completion of the District’s East/West Channel project (refer to Chapter 6, Cumulative Impacts and other CEQA Issues, for a description of this project).

**Administrative and Maintenance Buildings**

As part of the Master Plan, the City would construct a new Administration Building on the south side of Carl Road. The new Administration Building (currently planned as a two-story, 21,600 square foot structure) would replace several existing administrative and support buildings throughout the site, consolidating administration, outreach, operations, laboratory, and compliance inspection functions under one roof. A reconfigured parking area south of the existing administration building along Carl Road would support employee and visitor parking. The Administration Building would be implemented following relocation of public access to the Bay Trail system from Carl Road to...
Figure 3-10
Other Facility Improvements

SOURCE: Carollo Engineers
Caribbean Drive. Following the decommissioning and demolition of the existing administration building, the City would construct a new Maintenance Building (currently sized at 8,200 square feet) at that location to house plant and landfill maintenance and warehouse functions that currently occur in various locations throughout the site. The Administration Building would be supported by a shallow spread foundation.

**Stormwater Management**

Process flows (water removed during wastewater treatment that is not pumped to the next stage in the treatment process) and stormwater originating from surface runoff from the entire WPCP site would be routed to the Influent Junction Box. This stormwater, in combination with raw wastewater influent, would be pumped to the head of the preliminary treatment facilities for treatment.

**Influent Sewer Rehabilitation**

The risk of failure of certain raw sewage lines in the vicinity of the Influent Junction Box is currently unknown. To assess and minimize the risk for influent sewage line failure, a condition assessment of these pipelines would be conducted, followed by rehabilitation of pipelines as needed. Rehabilitation activities may include either sliplining of pipelines and manholes or replacement of pipelines and manholes along with installation of diversion structures during replacement. Rehabilitation activities may occur concurrently with the rehabilitation of other existing secondary and tertiary facilities.

**Support Utility Rehabilitation**

Concurrent with rehabilitation of existing facilities, selected existing components of the support utility systems would be rehabilitated within the main plant, including the potable water, utility water\(^{10}\), hot water, utility air\(^{11}\), digester gas, landfill gas, natural gas, tank drain, sanitary drain, storm drain, and recycled water systems.

**Parking and Site Access**

The proposed WPCP site layout includes additional access points for easier maintenance. The existing parking area along Carl Road would be reconfigured and expanded to provide approximately 90 parking spaces in the area south of the proposed maintenance building.

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\(^{10}\) Water used to support operation of plant facilities.

\(^{11}\) Air used to support operation of plant facilities.
3. Project Description

Lighting and Landscaping

Currently lights on poles (similar to streetlights) are operated at the site at night to ensure safe access to facilities, as the WPCP operates 24 hours per day. Lighting would be installed on or around the new facilities on the main plant site to afford security cameras adequate lighting for 24-hour surveillance of the new facilities.

The proposed landscaped areas for the WPCP have been developed in conjunction with the revised parking and circulation layout to provide shade, landscaped buffers and a welcoming entrance to the WPCP. Plants would be chosen to tolerate heat and pedestrian traffic, to create shade, and to screen the main plant from Carl Road. All landscaped areas would be watered with recycled water by an automatic irrigation system, designed to comply with the California Model Water Efficient Landscape Ordinance, including low volume drip emitters and/or bubblers and an automatic, self-adjusting irrigation controller that utilizes weather-based data or soil moisture data. Plants would be grouped into hydrozones, with similar watering needs.

Site Safety and Security

Site safety and security improvements would be made to improve protection of the WPCP facilities from undesirable/harmful acts and from other identified purposes that would interrupt the ability to provide service. The first stage of site safety and security improvements is being implemented under the Primary Treatment Facility project, and will primarily include a perimeter fence and closed circuit video cameras around the eastern half of the main plant site. The second stage would encompass the remaining western portion of the main plant site, and would be completed as part of existing plant rehabilitation.

Flood Protection

The WPCP site is within the 100-year flood hazard area because existing levees currently protecting the WPCP are not certified by the Federal Emergency Management Agency\(^\text{12}\). While the District’s planned East and West Channels project will provide protection from fluvial\(^\text{13}\) flood hazards, the City is proposing to address tidal flood hazards at the site through the Master Plan. Improvements that would provide protection from tidal flooding include construction of concrete walls and vinyl sheet walls around the perimeter of the WPCP and installation of retractable floodgates at each entrance to the WPCP. The floodwall would be designed at an elevation of 13.0 feet\(^\text{14}\) to meet the protection criteria established by Santa Clara County. The floodwall and retractable flood barrier would be implemented in two stages: the eastern half of the main plant site would be the first stage, and western portion of the main plant site would be the second stage. The floodwall would not encompass the new Administration Building.

\(^\text{12}\) The site is within an area designated as Special Flood Hazard Area Zone AE on Federal Emergency Management Agency Flood Insurance Rate Maps.

\(^\text{13}\) Fluvial flooding refers to flooding associated with rivers and streams. In the vicinity of the project site the SCVWD manages fluvial flooding via the Sunnyvale East and West channels. The West channel abuts the main plant to the west while the east channel is approximately 2,900 feet to the east of the project site.

\(^\text{14}\) Shown on Master Plan documents as plant datum 113.0 feet. The convention of Master Plan engineering is to add 100 feet to the NAVD88 elevation in order to make all elevations at the WPCP positive numbers.
3.4.8 Construction Characteristics

Construction of proposed improvements to treatment operations would involve several general types of activities: demolition or rehabilitation of some existing facilities and site clearing; earthwork (grading, excavation, sheet pile driving, and groundwater dewatering); and facility construction. These activities are described below. Construction would occur throughout the Master Plan period (20-plus years); within the construction period for each improvement there would be periods of more intensive activity and attendant peaks in construction traffic, typically occurring during earthwork, followed by longer periods of reduced activity. Table 3-3 lists heavy equipment that may be used for construction of Master Plan components.

**Table 3-3**

<table>
<thead>
<tr>
<th>CONSTRUCTION EQUIPMENT</th>
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<tr>
<td>• Earthmovers/Graders</td>
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<td>• Front-end loaders</td>
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<td>• Concrete pumper trucks</td>
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<td>• Welding trucks</td>
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<tr>
<td>• Pavement saw</td>
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<td>• Jackhammers</td>
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Rehabilitation, Demolition of Existing Facilities and Site Clearing

Facility rehabilitation would generally include changes to the processes or components of processes within existing structures, fixed growth reactors, air flotation tanks, and chlorine contact basins, and slip-lining of the primary effluent and pond effluent pipelines. Demolition of existing facilities (such as the primary sedimentation tanks, primary control building, pond effluent pipeline and administration building) would entail removal and proper disposal of all mechanical and electrical equipment, and demolition of above- and below-ground structures. Sites would then be cleared of all obstructions, including fences, utilities to be relocated or abandoned, asphalt pavements, and rubbish and rubble generated during demolition activities. Metals, concrete asphalt, and other recyclable materials would be reused or recycled consistent with the requirements of the City’s Source Reduction and Recycling Element and Zero Waste Strategic Plan. Holes resulting from the removal of underground structures or utilities would be backfilled with engineered fill meeting geotechnical engineering requirements. Vegetation and organic topsoil would be removed from relevant areas on the site and either removed from the site or stockpiled for later use in landscaping. It is conservatively assumed that over the course of the Master Plan period all trees would be removed from the main plant site. Slip lining of the existing primary effluent pipeline would require the temporary excavation of two pits. One pit would be within the main plant near the southern end of the existing primary effluent pipeline, and the other pit would be within the berm and recirculation channel of Pond 2 at the northern end of the existing pipeline.
Earthwork

Excavation

After site clearing, soil would be excavated to make room for the placement of foundations, pipes, tunnels, and underground utility corridors. Temporary slopes would be protected from excessive drying and/or saturation during construction to limit potential detrimental effects such as sloughing and erosion. Unstable or otherwise unsuitable soils may be over excavated to competent/acceptable soils or replaced with engineered fill. Excavation for the Administration Building could require removal of landfilled waste materials. Materials generated from excavations would consist of existing fill, native soils, and potentially waste in some instances. Excavated materials (spoils) would be stored temporarily onsite, to be used later as fill, or hauled offsite by truck for reuse or disposal. Demolition debris and excavated materials would be reused or recycled or (if recycling options do not exist) disposed in accordance with all applicable state and local rules and regulations.

Foundation Considerations and Soil Preparation

Due to potential consolidation settlement of clay underlying the main plant site, soil surcharging, over-excavation, and/or pile driving may be used prior to or as part of foundation installation in eastern portions of the main plant site. Depending on the final design of structures, significant amounts of engineered fills could be placed during backfills or during reworking of site soils to make them adequate to support the proposed improvements. Fill material would be sourced from excavated material stockpiled onsite or from offsite if necessary. Fill material would be placed in the portions of the site under construction, then graded and compacted.

Generally, Master Plan facilities to be constructed on the western portion of the main plant site would be supported by mat foundations on existing fill topped with 12 inches of compacted aggregate base. If any of the existing fills in these areas are found to be too loose, weak, or plastic to support the facilities, the existing fill would be replaced with engineered fill or compacted aggregate base. Structures built in the oxidation ponds, such as the diurnal equalization tanks and emergency storage, would include foundations designed to account for the presence of soft and highly compressible Bay Mud in the subsurface. Foundation installation techniques may include driven piles or ground improvement measures such as Cement Deep Soil Mixing or Compaction Grouting.

Dewatering

Excavation to depths below the groundwater table is likely at the site. Temporary sheet piles may be installed as shoring around excavated areas. Pile driving would be required to install sheet piles. Water (groundwater or collected stormwater) within the excavated areas would then be pumped to the primary treatment facility. All waters encountered or used within the main plant area would be managed and discharged to the WPCP storm drainage system, which is routed to preliminary treatment facilities for treatment.
Construction of New Facilities

Figure 3-5 depicts the footprints of proposed tanks, buildings, and other structures. Final design of the proposed facilities would occur according to the schedule in Figure 3-4. Construction of new buildings would primarily consist of conventional concrete block and steel construction methods.

Construction Access and Staging

Construction activities would occur primarily within the main plant. Staging areas for short-term storage of heavy equipment, piping and other materials, as well as parking for project construction workers would be provided onsite during the construction phases, as space is available and potentially at offsite locations (to be determined). To ensure that construction traffic can be accommodated without disrupting access, a designated construction access point has been located adjacent to the existing access gate as shown on Figure 3-5.

Construction Hours

Project construction would occur intermittently throughout the 20-plus year planning period. Construction activities are expected to occur primarily within normal City working hours, weekdays between the hours of 7:00 a.m. and 6:00 p.m., and, as necessary, Saturdays between 8:00 a.m. and 5:00 p.m. However, construction could periodically extend into the evening hours and over weekends to complete critical work.

3.4.9 Operating Characteristics

Operating Hours, Staffing, and Traffic

Once complete, the proposed Master Plan facilities would operate 24 hours per day, seven days per week, as the WPCP does currently. The work force is estimated to remain at 34 operations and maintenance staff.

Traffic loads associated with chemical deliveries to the WPCP site based on future build-out conditions (2035) would include 42 deliveries per month. The traffic loads associated with residuals hauling (e.g., biosolids, grit) at the build-out condition would include approximately 19 trucks per week.

Water Quality Management

Water quality monitoring at the Sunnyvale WPCP is required in accordance with waste discharge requirements set forth in Order R2-2014-0035 for National Pollutant Discharge Elimination System (NDPES) Permit No. CA00037621 issued by the RWQCB. The permit includes Monitoring and Reporting Program requirements that implement federal and state water quality laws and regulations at the WPCP. Pursuant to the Monitoring and Reporting Program, the WPCP monitors data that indicate the WPCP’s wastewater treatment performance. The performance of

15 Sunnyvale Municipal Code Section 16.08.030 normally limits construction activity to these hours.
the plant is measured by the rates of pollutant removal from the wastewater and pollutant levels present in the discharge as compared to the performance thresholds and effluent limits identified in the NPDES permit. The Monitoring and Reporting Program identifies monitoring locations, sampling frequency and type, and parameter to be sampled at each monitoring location. At the WPCP, operators and laboratory personnel take samples of the influent wastewater, effluent discharge to the WPCP receiving water (Moffett Channel), and the biosolids. Samples are monitored for many parameters, such as total suspended solids, biochemical oxygen demand, metals, and total ammonia nitrogen, at time intervals required by the NPDES permit (e.g., daily, weekly, or monthly). The WPCP also prepares and submits to the RWQCB monthly and annual summary reports to document compliance with NPDES permit requirements.

Water quality regulations change periodically, and NPDES permits are reissued every five years. For implementation of the Master Plan, which in part responds to anticipated changes in regulations, City staff would update its water quality monitoring practices. Water quality monitoring would be updated to reflect changes in water quality regulations and changes in plant operations.

3.5 Water Purification Facilities

3.5.1 Overview of Water Purification Facilities and Schedule

The City has entered into agreements with the District regarding an increase in the production and distribution of recycled water in Sunnyvale and other parts of Santa Clara County. Through these agreements, the City and the District are proposing a variation of the Master Plan, evaluated in this PEIR, to produce highly treated, purified water at the WPCP.

As described in Chapter 2, both the City and the District are engaged in broader recycled water planning efforts that could alter how the Water Purification Facilities (WPF; also called the MBR Variant) are ultimately designed and operated in the future. The WPF are evaluated in this PEIR at a program level of detail (as is the Master Plan). As planning and design progress, construction and operating characteristics of the WPF will be defined in greater detail, and the City or District will undertake additional (project-level) environmental review pursuant to CEQA prior to implementation.

Key aspects of the WPF include the following:

- **Sunnyvale WPCP.** Construction and operation of membrane bioreactor (MBR), reverse osmosis (RO), ultraviolet disinfection (UV) and advanced oxidation, and related facilities at the WPCP. The WPF would produce purified water and RO concentrate (a byproduct of the RO process). Many of the facilities associated with the WPF would replace those proposed under the Master Plan. For example, the City would implement membrane bioreactor process facilities instead of conventional activated sludge and deep bed filtration process facilities. In addition, the split flow concept would not be implemented if the WPF are built. The layout of planned facilities at the WPCP also would change to accommodate the WPF.

- **Purified Water Use.** The primary purpose of the WPF is to replenish groundwater levels in the Santa Clara Valley. The District would use the purified water to recharge the groundwater basin. The recharged purified water would increase groundwater supplies for
the beneficial uses of the groundwater basin, which include drinking water. The use of purified water for groundwater recharge with the intent of augmenting drinking water supplies is referred to as indirect potable reuse (IPR).

- **Conveyance and Groundwater Replenishment.** The City and the District would repurpose existing pipelines or construct new pipelines to convey the purified water to injection wells and recharge basins several miles south of the WPCP. The District intends to construct and operate a series of wells to inject the purified water into the groundwater basin. The District would also convey the purified water to existing basins within its Los Gatos Groundwater Recharge System to percolate the purified water into the groundwater basin.

- **RO Concentrate Management.** There are three options currently under consideration for managing the RO concentrate generated by the RO process: blending it with WPCP effluent for discharge to Moffett Channel, discharging it into a created wetland, or conveying it to an existing deepwater outfall for discharge into the San Francisco Bay.

- **Schedule and Phasing.** As with the Master Plan, the small site of the WPCP drives the phasing; some facilities must be decommissioned and demolished before there is space to construct new facilities, while the WPCP maintains operations 24 hours per day. The WPF would change the overall schedule and phasing for the Master Plan. For example, construction of the diurnal equalization and emergency storage would occur 10 years sooner. Figure 3-11 presents the schedule for the Master Plan with implementation of the WPF as well as the implementation schedule for conveyance and recharge facilities. Schedule details presented herein may change as planning of individual improvements progresses into design.

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Figure 3-11
Water Purification Facilities Implementation Schedule
The following terms are used in this EIR to refer to the Water Purification Facilities and parts thereof:

- Water Purification Facilities includes all components: those proposed at the WPCP and those located off site.
- Groundwater Replenishment Facilities includes the injection wells, the existing recharge basins, and pipelines needed to convey purified water to these facilities.

### 3.5.2 Location of Water Purification Facilities

The Sunnyvale WPCP is located within the City of Sunnyvale (refer to Section 3.1). **Figure 3-12** shows the general location of potential District groundwater replenishment facilities. Existing recharge basins that could be used for groundwater replenishment are in the City of Campbell and are part of the Los Gatos Groundwater Recharge System, near the intersection of Highways 17 and 85. The District has not determined the specific location of injection wells or pipelines. Injection wells would be sited within an area roughly bordered by Highway 85, San Tomas Aquino Creek, and Calabazas Creek. Pipeline alignments between the WPCP, the injection well siting area and the recharge basins have not been determined but could be located in the Cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara. **Figure 3-13** shows the layout of the WPCP with implementation of the Water Purification Facility.

### 3.5.3 Need for the Water Purification Facilities

**City of Sunnyvale**

As described in Section 3.2, the Master Plan tackles challenges associated with aging infrastructure and operational reliability, changing regulations, and projected increases in flows and loads; and promotes management decisions to improve recycled water production. The City is committed to rehabilitating the WPCP to address these challenges. If implemented, the WPF would address these challenges and management decisions through different improvements to secondary and tertiary treatment processes (e.g., implementation of MBRs instead of conventional activated sludge and filter facilities) while also contributing to District efforts to address the major water supply constraints facing the City and rest of the Santa Clara Valley, described below.

**Santa Clara Valley Water District**

As described in Chapter 2, the District needs additional water supplies to meet projected future water supply shortfalls. In addition, the current drought, now extending into its fourth year, is causing significant declines in the County’s groundwater levels which may lead to irreversible subsidence of the land, potentially resulting in catastrophic effects on the County’s infrastructure and economy. Purified water produced from treated wastewater is a locally developed, and reliable water supply that can be used to supplement raw water currently used for groundwater recharge. Provided through proven technologies, it is a drought-resistant water supply that can help ensure Santa Clara County has safe sustainable water. The District’s Board policy E-2.1.4 calls for the development and maintenance of recycled and purified water to ensure a reliable, clean water
Conveyance Via Existing or New Pipelines (Conceptual Alignment)

Siting Area for Injection Wells

Figure 3-12
Potential District
Groundwater Replenishment Facilities
supply for current and future generations. In line with this policy, the District has developed the Expedited Recycled and Purified Water Program to provide, by 2035, capability for producing up to 72,000 acre-feet per year of nonpotable recycled water and purified water through partnerships with the four recycled water producers in the county. The WPF would provide purified water treated to the level considered safe for potable reuse as required by state water quality statutes and regulations.

### 3.5.4 Objectives of the Water Purification Facilities

#### City of Sunnyvale

The Variant would be consistent with the City’s Master Plan objectives presented in Section 3.3. In particular, the Variant would help implement City goals to maximize water recycling opportunities by enhancing supplies and producing a higher quality recycled water than existing processes.

#### Santa Clara Valley Water District

The District’s objectives for the Water Purification Facilities are as follows:

- Help meet the District’s water supply goals.
- In partnership with recycled water producers, develop new, local, drought-resistant water supplies.
- Provide flexibility with respect to the District’s potable reuse treatment options.
- Develop the use of purified water for groundwater recharge, consistent with the District’s adopted Water Supply Strategy.
- Provide a sustainable water supply for long-term/future demands.

### 3.5.5 Water Purification Processes at the WPCP

The first stage of Water Purification Facilities would replace the existing secondary facilities as well as the dual media filters, which would be decommissioned after the MBR facilities are fully operational to provide space for the reverse osmosis and UV facilities (refer to Figure 3-13). The existing oxidation ponds, fixed growth reactors, air flotation tanks, and filters would be decommissioned sooner (around 2025) if MBRs are implemented, compared to when they would be decommissioned if conventional activated sludge facilities were implemented (around 2035). As a result, fewer rehabilitation improvements would need to be made to these facilities to keep them operational until 2025.
Figure 3-13
Proposed WPCP Layout with Water Purification Facilities
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Figure 3-14 presents a treatment process flow schematic for the WPCP with implementation of the Water Purification Facilities.

**Conversion of Secondary Treatment to Membrane Bioreactors**

The City would implement membrane bioreactors (MBRs) instead of conventional activated sludge for secondary treatment. The membranes can be designed for and operated in small spaces with high removal efficiency of contaminants. MBRs are a combination of activated sludge reactors and membrane systems. Membrane systems are pressure driven solids separation processes, which use membranes with extremely small pore spaces to remove particles. The membrane system would replace the function of the secondary clarifiers and deep bed filters that would be required if conventional activated sludge facilities were implemented.

The basic facilities for the MBR process include aeration basins, membrane tanks, drum screens and step screens, MBR support facilities (air scour blowers, pumps), clean-in-place\textsuperscript{16} facilities, and return activated sludge/waste activated sludge pumping station (see Figure 3-13). With an MBR treatment process, the primary effluent would flow by gravity from the primary sedimentation tanks to the MBRs. From the MBRs, process flows would be pumped to chlorine contact basins. The MBR facilities would be implemented in two stages. The Stage 1 facilities would fully replace the existing secondary treatment system, including all tanks, and would include demolition of the existing fixed growth reactors and air flotation tanks. The major elements of Stage 1 would include:

- Fine screens – to prescreen primary effluent
- Aeration basins
- Blower building and aeration blowers
- Step screens – to screen mixed liquor
- Membrane tanks
- Return activated sludge/waste activated sludge pump station
- Primary effluent distribution structure
- Demolition of existing air flotation tanks and fixed growth reactors

Additional piping, gates, valves, and/or other equipment would be required to convey MBR effluent directly to the disinfection process and bypass the existing deep bed filtration process.

Stage 2 would be implemented based on either regulatory changes or increases in flows and loads (e.g., as a result of population increases in Sunnyvale). Stage 2 would include additional aeration blowers and membrane racks, and associated support equipment.

\textsuperscript{16} Clean-in-place is a method of cleaning the interior surfaces of pipes, vessels, process equipment, filters and associated fittings, without disassembly. Clean-in-place facilities would be used for both MBR and RO to clean the membranes associated with each process. The MBR clean-in-place facilities will be housed in a separate structure on the site, adjacent to the RAS/WAS pump station. The RO clean-in-place facilities will be housed within the RO structure.
Figure 3-14

Water Purification Facility Processes

SOURCE: ESA, Carollo Engineers

1 Projected 2035 average dry weather flow per Master Plan Flow and Loads Evaluation Technical Memorandum. Aeration basins have capacity to treat up to 34.7 mgd.
Diurnal Equalization and Emergency Storage and Decommissioning of Ponds 1 and 2

With replacement of the existing secondary treatment process the oxidation ponds would no longer be used. Because the existing ponds provide both equalization and storage capabilities, the WPCP would require the construction of replacement diurnal equalization and emergency storage basins. Once the MBR is operational the oxidation ponds would be decommissioned. Proposed future uses of the ponds would be as described in Section 3.4.3.

Reverse Osmosis, Ultraviolet Disinfection, and Advanced Oxidation Processes

This advanced treatment facility would be designed to produce a source water supply consistent with indirect potable reuse, utilizing RO, UV disinfection (described in Section 3.4.4), and advanced oxidation process (AOP) facilities. RO is a process in which dissolved inorganic solids (such as salts) are removed from a solution (such as water). This is accomplished by pushing the water through a semi-permeable membrane: pressure is exerted on the side with the concentrated solution to force the water molecules across the membrane. The membrane allows the water to pass through while capturing the impurities or contaminants. The RO process produces product water or permeate (purified water) and RO concentrate (also referred to as brine). Advanced oxidation involves addition of an oxidant to the effluent upstream of the UV reactors. The added oxidant reacts with the UV light to form free radical ions\(^{17}\) that react with and destroy a wide range of trace organic contaminants.

Due to the location on the WPCP site, construction of the RO/UV-AOP process would follow startup of the MBR facilities (to maintain permit compliance the fixed growth reactors and air flotation tanks must remain in operation until the MBR facilities are fully operational). The major elements of this improvement are shown on Figure 3-13 and would include:

- RO feed pumps and wetwell
- Cartridge filters
- Four 2.5 mgd RO trains
- Booster pumps
- Low pressure/high output UV reactors
- Packed tower aerators (decarbonators)
- Finished water storage/pump station (three pumps)
- RO clean-in-place facilities
- Utility water pumps
- Bulk chemical storage of sodium hypochlorite, aqueous ammonia, sulfuric acid, and scale inhibitor
- Lime System

\(^{17}\) Free radical ions are charged particles which are charged as a result of having an odd number of electrons.
The description of Water Purification Facilities at the WPCP presented herein is based on a facility that could produce 10 mgd of high quality recycled water but could be expanded to 15 mgd, should recycled water demands increase in the future and additional reductions in effluent flow as a result of increased purified water production are permitted by the relevant agencies. Evaluations of reverse osmosis concentrate management during project design would inform facility sizing.

**Tertiary Treatment and Water Recycling**

The MBR process would meet Title 22 requirements for filtration and no additional filtration would be required. With this configuration, the deep bed filters would be decommissioned and no longer used. Effluent from the membrane facilities would be routed directly to the disinfection facilities. The implementation of the MBR treatment process would eliminate the need for the microfiltration facility described in Section 3.4.4. Proposed changes to disinfection would be as described for the Master Plan. As the MBR facility would fully replace existing secondary treatment, it would need to be sized to treat the total process flow.

**Biosolids**

Proposed changes to biosolids processing would be as described for the Master Plan although the site configuration (the locations of the Thickening/Dewatering Building, Biosolids Post Processing, Fifth Digester, and Phosphorus Recovery Facility) would differ.

**Electrical and Combined Heat and Power**

The power building being constructed as part of the Primary Treatment Facility project would be large enough to accommodate the additional equipment needed for the water purification facility. Electrical distribution system equipment to be installed as part of the Master Plan (described in Section 3.4.6) would be upgraded to accommodate the Water Purification Facility. The main switchgear capacity would be increased, the switchgear building would be 6 feet longer, and larger duct banks would be installed to support the facilities proposed as part of the Water Purification Facility. The anticipated total energy demand of the WPCP at buildout of the WPF would be approximately 7,000 kW (amounting to approximately 61,320 MWh/year). For the same reasons described above in Section 3.4.6, approximately 1,000 kW of energy would be produced onsite. The remaining power needed to run the WPCP would be purchased as electricity from PG&E.

**Support Facilities and Related Actions**

Support facilities and related actions (closure of Carl Road and relocation of access to the Bay Trail, construction of new administrative and maintenance facilities, tidal floodwall, and others) would generally be as described in Section 3.4.7.
3.5.6 RO Concentrate Management Planning

As part of on-going planning, the City and District have identified three possible options for managing concentrate generated by RO operations. These RO concentrate management options were initially identified in the South Bay Water Recycling Strategic and Master Plan (SCVWD, San José; 2014). Options considered by the City to be potentially applicable to the WPF include use of the WPCP’s existing outfall, use of an existing deep water outfall, or use of wetlands either for treatment or for restoration enhancement. These options are discussed below. The City and District would conduct detailed evaluations of concentrate management options as part of preliminary engineering for the WPF.

**Use of Existing WPCP Outfall Option**

One option for RO concentrate disposal would involve combining the RO concentrate with final effluent prior to release into the Bay via the WPCP’s shallow water outfall. The WPCP discharges into Moffett Channel which is a tributary to Guadalupe Slough. This option would involve blending the RO concentrate with the final effluent (e.g., in the WPCP’s chlorine contact basins). A key consideration for this option is the effect of the RO concentrate on final effluent quality. Studies during preliminary design would include demonstration of discharge quality through implementation of modeling and/or pilot testing of RO recovery rates, concentrate blending ratios, resulting concentrations of constituents of concern, and the ability of the discharge to meet acute and chronic toxicity requirements. Such studies would confirm the appropriate ratio of RO concentrate to final effluent, whether any additional treatment steps would be warranted to meet NPDES requirements for the desired RO recovery rate, or whether this option should be implemented in combination with one of the management options described below.

**Deep Water Outfall Option**

The RO concentrate could be discharged via an existing deep water outfall in the San Francisco Bay. Like other WPCPs south of the Dumbarton Bridge, the Sunnyvale WPCP’s NPDES Permit limits are more stringent than facilities with deep water outfalls north of the Dumbarton Bridge, which have higher dilution ratios\(^\text{18}\) for effluent standards. As identified in the South Bay Water Recycling Strategic and Master Plan, the East Bay Dischargers Authority (EBDA) operates a deep water outfall. Facilities required to convey the RO concentrate to the EBDA system would include a pump station and pipelines. An agreement between the District and EBDA, and potentially Union Sanitary District would be required, the terms and conditions of which have not been determined. Studies during preliminary design for this option would require confirmation of available system capacity, identification of optimum pipeline routes and tie-in locations, costs, demonstration of the discharge quality through implementation of modeling and/or pilot testing to determine RO recovery rates, concentrate blending ratios, resulting concentrations of constituents of concern, and the ability of the discharge to meet acute and chronic toxicity requirements.

\(^{18}\) In this context the dilution ratio is the receiving water flow divided by the effluent flow (SWRCB, 2005).
Wetlands Option

A third option for management of all or a portion of RO concentrate would involve the use of wetlands for treatment and/or for beneficial reuse in restoration. Many of the ponds near the WPCP (those surrounding the oxidation ponds and SCVWD Pond A4, shown on Figure 3-2) are former Cargill Salt production ponds that are now part of the South Bay Salt Pond Restoration Project, which is restoring over 15,000 acres of former tidal wetlands in the South Bay. As indicated in Section 3.4.3, the City proposes to explore opportunities to implement habitat restoration within Ponds 1 and 2 following decommissioning, in association with the provision of flood protection for the WPCP. In addition, habitat restoration within Pond A4 has been considered by the District as well.

Potential scenarios for using wetlands to manage RO concentrate include creating an engineered wetland to provide treatment (if studies indicate the need for such treatment) or using the RO concentrate to enhance restoration. Engineered wetlands have been shown to improve water quality by reducing the concentration of nutrients and trace contaminants, reducing acute and chronic toxicity, and reducing the overall volume of RO concentrate (SCVWD, San José; 2014). Engineered wetlands to provide treatment could be created within Ponds 1 or 2 following decommissioning. Treated effluent from the engineered wetland would be discharged using the existing outfall or conveyed to another location for ultimate disposal. The anticipated salinity of the RO concentrate would be from 3,100 to 4,500 milligrams per liter (mg/L), which could support brackish marsh vegetation in upland transition zones along the edges of tidal marsh restoration areas, or within the transition zones of an ecotone slope. At the Sunnyvale WPCP, this type of use could be integrated into the design of flood levees. Alternatively, the RO concentrate could be piped to other locations where wetland restoration is currently in progress, such as Ponds A1/A2W in Mountain View. Using RO concentrate in wetlands restoration would require that the City and/or District conduct integrated planning with the entities involved in restoration, and potentially with future planning of coastal flood control in the region.

Adaptive Management

The RWQCB has indicated that, for projects like the WPF which have the potential to substantially change WPCP discharges as a result of development of water reuse projects, the use of an adaptive management approach may be considered. Adaptive management is a systematic approach for improving resource management by learning from management outcomes, and can be useful in cases where natural resources are responsive to management but uncertainty exists about the impacts of management interventions. Adaptive management is based on the recognition that

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19 Because the ponds would be breached to restore tidal action as part of a restoration project, the marginal flood protection provided by the levees surrounding the ponds would be lost. Consequently, flood protection for the WPCP would need to precede the breaching of the levees.

20 An ecotone is a transitional area between two different ecosystems, in this case the transition between dry grassland and the San Francisco Bay.

21 While multiple definitions of adaptive management have developed over time, definitions in published literature identify adaptive management as a process involving learning (the accumulation of understanding over time) and adaptation (the adjustment of management over time). The sequential cycle of learning and adaptation leads naturally to two beneficial consequences: (i) better understanding of the resource system, and (ii) better management based on that understanding (Williams and Brown, 2012).
resource systems are only partially understood, and there is value in tracking resource conditions
and using what is learned as the resources are being managed (Williams and Brown, 2012). The
adaptive management framework could be applied to release of RO concentrate to the
environment via one of the management options discussed above.

3.5.7 Groundwater Replenishment Facilities

Preliminary Engineering

As described in Section 2.3.1, Expedited Recycled and Purified Water Program, preliminary
planning for the WPF associated with the Sunnyvale WPCP is underway. Preliminary planning and
studies will support facilities planning, RO concentrate management, groundwater management,
and facilities operation.

The locations and/or operation of the purified water pipeline, injection wells, and recharge basins
identified below are preliminary and will be affected by the outcome of the preliminary
engineering studies. Preliminary studies would also be undertaken to assess potential groundwater
changes caused by operation of the injection wells and recharge basins. Additional information
about the preliminary engineering to be conducted for the purified water pipeline, injection wells,
and recharge basins are described below.

Purified Water Pipeline

As shown on Figure 3-12, the purified water would be conveyed from Sunnyvale WPCP to facilities
to the south of the WPCP. As planning progresses the District will confirm whether existing
pipelines would be repurposed for conveying the purified water to the injection wells and recharge
basins, or whether a new pipeline or pipelines would be constructed. No specific alignments for
new pipelines have been identified to date.

Injection Wells

The District is considering increasing groundwater recharge capabilities on the west side of Santa
Clara County through the development and operation of injection wells. The District previously
analyzed direct injection using purified water in the South Bay Water Recycling Strategic Master
Plan (2014). Approximately 18 wells capable of injecting approximately 10,000 AFY would be sited
in an area roughly bordered by Highway 85, San Tomas Aquino Creek, Calabazas Creek, and the
confined aquifer zone (refer to Figure 3-12). The wells would require sites about 20 feet by 20 feet in
size and spaced at least 1,500 feet apart. Although no specific sites will be identified until feasibility
studies are completed, preliminary sites considered to date include open space, parks, schools, and
residential parcels.

Recharge Basins

The Los Gatos Groundwater Recharge System consists of percolation ponds along Los Gatos
Creek. Purified water would be delivered to each of the four off-stream pond areas within the
Los Gatos Groundwater Recharge System, as shown on Figure 3-12. Together, these four pond systems have a combined recharge capacity of approximately 20,200 AFY. Depending on the demand scenario utilized, some or all of this recharge capacity would be satisfied using purified water in lieu of raw water.

A new lateral from the main pipeline would serve the McGlincey Ponds via Camden Avenue. The remaining three ponds—Budd, Sunnyoaks, and Page—would be served via a connection to Page Ditch.

In addition, the District is currently exploring the development of a new percolation pond in the future, to further increase recharge on the west side of the County. However, it is currently unclear if sites are available or feasible so these potential facilities are not included in the Variant analysis.

**Groundwater Studies**

Proposed groundwater studies include establishing test wells, conducting monitoring and related studies for all IPR recharge areas, and undertaking tracer tests and/or groundwater modeling to determine underground retention time. The groundwater studies would evaluate the effects on groundwater of purified water injection or percolation by: simulating groundwater conditions; constructing monitoring wells; analyzing soil samples for characteristics that could affect water quality; and developing a groundwater monitoring plan.

As part of the preliminary engineering, the District would establish test wells and assess the feasibility of each site for issues such as:

- Depth to groundwater. Preliminary information indicates that each well would be 16 inches in diameter and screened between 500 and 800 feet below ground surface.
- Volume of purified water that can be injected
- Retention time to nearest down gradient production well
- Mounding
- Location of production wells
- Land acquisition requirements

**3.5.8 Construction Characteristics of the WPF**

Construction of proposed improvements at the WPCP would involve the same type of construction activities as described in Section 3.4.8 and the same type of construction equipment as listed in Table 3-3. Injection well construction would involve site preparation (e.g., grading, demolition if needed). The actual drilling could require 24-hour construction. Equipment likely would include backhoe/frontloader, drilling rig, and test pump and engine.

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22 Groundwater mounding is the buildup of groundwater in a localized area, and is caused by recharge to the saturated zone concentrated in a small area (as with injection wells). Excessive mounding can cause various problems, including reduced recharge rates and structural instabilities in the overlying earth material.
If a new pipeline is required, construction would mostly likely occur within existing public streets. The most common technique for constructing pipeline within existing streets is open trenching (also called “cut and cover”). Open trench construction involves:

- Utility locating/potholing
- Sawcutting the pavement
- Excavating a trench
- Removing and stockpiling the soils
- Installing the pipeline
- Backfilling the trench
- Repaving

Open trench construction could require closure of at least one travel lane, depending on roadway width and size of the pipeline and trench. Excavated soils would either be hauled offsite or used to backfill the trench, depending on the characteristics of the soil. Typical construction equipment associated with installation of pipelines include pavement saws, jack hammers, excavators, backhoes, dump trucks, front-end loaders, forklifts, flatbed delivery trucks, mobile concrete batch plants, soil-cement mixing machines, paving equipment (asphalt and/or concrete trucks, rollers), water trucks, and vibratory compactors.

Trenchless pipeline installation such as bore and jack could also be used to construct new pipelines to avoid disruption of surface features like creeks or major streets.

Construction activities for the injection wells are not yet identified, but are expected to include grading, well drilling, installation of pipeline connections, and installation of electrical equipment and pumps. Drill rigs would be required to construct the wells. During the well-drilling stage of injection well construction, continuous 24-hour construction would be necessary.

### 3.5.9 Operating Characteristics of the WPF

The Water Purification Facility would operate 365 days per year, 24 hours per day. The operating characteristics would be determined during conceptual engineering. An estimated total of 3-4 workers would operate the WPF (including at the WPCP and onsite).

### Water Quality Management

The District has the responsibility and authority to manage the Santa Clara and Llagas groundwater subbasins in Santa Clara County per an act of the California Legislature (the Santa Clara Valley Water District Act; SCVWD, 2013). The Groundwater Recharge facilities would replenish groundwater in the Santa Clara subbasin. The District’s objectives and authority related to groundwater management are to recharge groundwater basins; conserve, manage and store water for beneficial and useful purposes; increase water supply; protect surface water and groundwater from contamination; prevent waste or diminution of the District’s water supply; and ensure sufficient water is available for present and future beneficial uses (SCVWD, 2013).

To achieve its groundwater management objectives, the District monitors groundwater levels, land subsidence, and surface water and groundwater quality. The District conducts groundwater quality monitoring to characterize regional groundwater quality conditions, determine the severity and
extent of any contamination, evaluate temporal trends in water quality, and identify any threats to groundwater to determine where further study or action is warranted to protect groundwater resources (SCVWD, 2012b). More than 70 wells are sampled annually, and samples are analyzed for basic water quality parameters, major ions, total dissolved solids, and nutrients (SCVWD, 2012b). The groundwater analysis results are reported annually in a Groundwater Quality Report. An additional 50 wells are sampled on a three-year cycle to address specific groundwater quality concerns (such as salt water intrusion). Groundwater quality information from other public water suppliers is also acquired annually by the District from the state of California. The water quality parameter values are compared to health-based drinking water standards and agricultural objectives (which determine the suitability of the groundwater for agricultural uses) in the annual report.

Groundwater samples are collected by the District in accordance with standard practices developed by the U.S. Geological Survey. Samples are then handled and stored in accordance with the analytical method requirements and are delivered to state-certified laboratories for analysis. The District’s laboratory, which is certified under the SWRCB Division of Drinking Water Environmental Laboratory Accreditation Program, is used for sample analysis whenever possible (SCVWD, 2012b).

The District is in the process of expanding its monitoring well network by drilling multi-level monitoring wells near existing and planned indirect potable reuse facilities. Initially the District would conduct quarterly monitoring for various analytes, including constituents of emerging concern. In the long term, data collection from these monitoring wells would be integrated into the annual sampling program.

3.6 Uses of the PEIR

3.6.1 Required Actions and Approvals

The information contained in this PEIR will be used by the City of Sunnyvale (the CEQA lead agency) as it considers whether to implement the Master Plan. In addition to the City, various governmental agencies may use this PEIR in reviewing, approving and/or permitting various components of the project. Table 3-4 identifies the actions and approvals that may be required in the future by agencies with discretionary authority over specific aspects of the proposed project. Additional approvals may be identified in the future as planning and design of Master Plan components like diurnal equalization and emergency storage, retirement/restoration within Ponds 1 and 2, and flood protection progress.

3.6.2 Use of EIR in Approving Future Projects

This PEIR provides environmental review for project components that are analyzed at a program level of detail. Before these components, including the WPF, are approved or constructed, the City will determine additional environmental review requirements. Subsequent or supplemental environmental documents may be “tiered” from this PEIR. In such a case, this PEIR may be used to address the environmental impacts of the Master Plan as a whole, thereby allowing the subsequent document to address the more detailed, site-specific issues of the particular project.
### TABLE 3-4
**POTENTIAL REVIEW AND APPROVAL ACTIONS BY OTHER AGENCIES FOLLOWING COMPLETION OF PROJECT-LEVEL CEQA**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Review and Approval</th>
</tr>
</thead>
</table>
| U.S. Army Corps of Engineers                | • Permit for dredging and filling of waters of the United States and wetlands under Section 404 of the Clean Water Act  
|                                             | • Letter of Permission under Section 10 of the Rivers and Harbors Act for discharge of dredged or fill material in navigable waters of the United States |
| U.S. Fish and Wildlife Service              | • Section 7 consultation under the federal Endangered Species Act  
|                                             | • Approvals related to construction in Cargill Channel, habitat restoration  
|                                             | • Land use approvals for activities affecting national wildlife refuge |
| National Marine Fisheries Service           | • Section 7 consultation under the federal Endangered Species Act |
| U.S. Environmental Protection Agency        | • Compliance with EPA Class V Well Requirements, as applicable |
| California State Lands Commission           | • Potential approval for actions in tidelands |
| California Department of Fish and Wildlife  | • Lake and Streambbed Alteration Agreement |
| SWRCB Division of Drinking Watera           | • Review of activities related to production, transmission, and use of recycled water  
|                                             | • Review compliance with Title 22 Groundwater Replenishment Regulations for indirect potable reusea |
| Regional Water Quality Control Board        | • Approvals under Sections 303, 304, 401, and 404 of the Clean Water Act  
|                                             | • Review of post-closure land use for structures on or within 1,000 feet of the Sunnyvale Landfill  
|                                             | • Review Wastewater Petition for Change of Dischargea  
|                                             | • Review NPDES Waste Discharge Requirements and/or Water Recycling Requirements, as applicable |
| Bay Conservation and Development Commission | • BCDC Permit  
|                                             | • San Francisco Bay Plan Consistency Determination |
| Bay Area Air Quality Management District     | • Authority to Construct/Permit to Operate  
|                                             | • Review of post-closure land use for structures on or within 1,000 feet of the Sunnyvale Landfill |
| Santa Clara Valley Habitat Agency            | • Administers the Santa Clara Valley Habitat Plan, which evaluates natural-resource impacts and mitigation requirements in the Habitat Plan area a |
| Santa Clara County Department of Environmental Health | • Review and approval of post-closure land use for structures on or within 1,000 feet of the Sunnyvale Landfill |

a Actions and approvals necessary for the Water Purification Facilities
3. Project Description

3.7 References


CHAPTER 4
Environmental Setting, Impacts, and Mitigation Measures

4.1 Introduction

4.1.1 Organization of Chapter 4
This chapter presents evaluations of the effects of implementation of the Sunnyvale Water Pollution Control Plant Master Plan (Master Plan) on the environment, and is organized by resource topic, as follows:

<table>
<thead>
<tr>
<th>Sections</th>
<th>4.9 Hydrology</th>
<th>4.10 Water Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Overview</td>
<td></td>
<td></td>
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<tr>
<td>4.2 Land Use and Recreation</td>
<td></td>
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<tr>
<td>4.3 Transportation</td>
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<td></td>
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<tr>
<td>4.4 Noise and Vibration</td>
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<tr>
<td>4.5 Air Quality</td>
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<td></td>
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<tr>
<td>4.6 Greenhouse Gas Emissions</td>
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<tr>
<td>4.7 Biological Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.8 Geology, Soils, Seismicity, and Mineral Resources</td>
<td></td>
<td></td>
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<tr>
<td>4.9 Hydrology</td>
<td></td>
<td></td>
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<tr>
<td>4.10 Water Quality</td>
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</tbody>
</table>

Each section of Chapter 4 contains the following elements, based in part on requirements of the California Environmental Quality Act (CEQA):

- **Setting.** This section presents a description of the existing physical environmental conditions in the vicinity of the project with respect to each resource topic at an appropriate level of detail to allow the reader to understand the impact analysis.

- **Regulatory Setting.** This section describes the relevant laws and regulations that apply to protecting the environmental resources within the proposed project area, and the governmental agencies responsible for enforcing those laws and regulations.

- **Impacts and Mitigation Measures.** This section evaluates the potential for the proposed project to adversely affect the physical environment described in the setting. Significance criteria for evaluating environmental impacts are defined at the beginning of each impact.
4. Environmental Setting, Impacts, and Mitigation Measures

4.1 Introduction

analysis section, followed by a discussion ("Approach to Analysis") that explains how the thresholds of significance are applied in evaluating the project. The conclusion of each impact analysis is expressed in terms of impact significance, discussed in Section 4.1.2 below. This section also identifies feasible mitigation measures for all of the impacts considered significant.

Impacts and mitigation measures are coded with the letters shown in Table 4.1-1, below. Mitigation measures are numbered to correspond with the impact numbers; for example, Mitigation Measure AES-1 addresses Impact AES-1.

<table>
<thead>
<tr>
<th>Code</th>
<th>Environmental Issue</th>
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</thead>
<tbody>
<tr>
<td>AES</td>
<td>Aesthetics</td>
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<tr>
<td>AQ</td>
<td>Air Quality</td>
</tr>
<tr>
<td>BIO</td>
<td>Biological Resources</td>
</tr>
<tr>
<td>C</td>
<td>Cumulative Impacts</td>
</tr>
<tr>
<td>CUL</td>
<td>Cultural Resources</td>
</tr>
<tr>
<td>ENER</td>
<td>Energy Conservation</td>
</tr>
<tr>
<td>GEO</td>
<td>Geology, Soils, Seismicity and Minerals</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas Emissions</td>
</tr>
<tr>
<td>GI</td>
<td>Growth Inducement</td>
</tr>
<tr>
<td>HAZ</td>
<td>Hazards and Hazardous Materials</td>
</tr>
<tr>
<td>HYD</td>
<td>Hydrology</td>
</tr>
<tr>
<td>LU</td>
<td>Land Use and Recreation</td>
</tr>
<tr>
<td>NOI</td>
<td>Noise and Vibration</td>
</tr>
<tr>
<td>PS</td>
<td>Public Services and Facilities</td>
</tr>
<tr>
<td>TR</td>
<td>Transportation</td>
</tr>
<tr>
<td>UT</td>
<td>Utilities and Service Systems</td>
</tr>
<tr>
<td>WQ</td>
<td>Water Quality</td>
</tr>
</tbody>
</table>

Within each section of Chapter 4, separate descriptions are provided for the Water Purification Facilities. "WPF" appears at the beginning of each impact statement and mitigation measure that apply to the Water Purification Facilities.

4.1.2 Significance Determinations

The thresholds of significance used in this EIR are based on the City of Sunnyvale’s (City) guidance regarding the thresholds of significance used to assess the severity of the environmental impacts of the proposed project. The thresholds of significance used to analyze the various environmental resource topics are presented in each section of Chapter 4 before the discussion of impacts. The categories used to designate impact significance are:

- **No Impact (NI).** An impact is considered not applicable (no impact) if there is no potential for impacts or the environmental resource does not occur within the project area or the area of potential effect.
4. Environmental Setting, Impacts, and Mitigation Measures

4.1 Introduction

- **Less than Significant impact, no mitigation required (LS).** This determination applies if there is a potential for some limited adverse effect, but not a substantial impact that qualifies under the significance criteria as a significant impact.

- **Less than Significant impact with Mitigation (LSM).** This determination applies if the project would result in an adverse effect that meets the significance threshold, but feasible mitigation is available that would reduce the impact to a less-than-significant level.

- **Significant and Unavoidable impact for which feasible mitigation is not available (SU).** This determination applies if the project would result in an adverse effect that meets the significance threshold, but for which there appears to be no feasible mitigation available to reduce the impact to a less-than-significant level. Therefore, the impact is significant and unavoidable.

4.1.3 Program Level Analysis

As described in Section 1.1.1 (Chapter 1, Introduction) this is a Program EIR. Prior to approval of individual WPCP improvements, the City will undertake further environmental review pursuant to CEQA when conceptual design is completed and construction details developed. When the City undertakes subsequent environmental review, the information contained in this EIR will be revisited to determine the accuracy and the adequacy of these evaluations. In accordance with criteria set forth in CEQA¹, this EIR can:

- Provide the basis in an Initial Study for determining whether a specific Master Plan improvement may have significant effects;

- Be incorporated by reference to address regional influences, secondary effects, cumulative impacts, alternatives, and other factors that apply to the Master Plan as a whole; and

- Focus subsequent environmental review to permit discussion solely of new effects or more adverse effects than those considered in this EIR.

Similarly, in implementing Water Purification Facilities the Santa Clara Valley Water District can use the PEIR to streamline subsequent environmental review.

4.1.4 Mitigation Measures

CEQA Guidelines Section 15126.4(a) (1) states that an EIR “shall describe feasible measures, which could minimize significant adverse impacts...” Section 15126.4(a) (3) also states that “mitigation measures are not required for effects which are not found to be significant.” In this EIR, mitigation measures are identified (where feasible) for all significant impacts.

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¹ CEQA Guidelines Section 15168(d).
4.2 Land Use and Recreation

This section describes existing land uses and recreational resources within and surrounding the Sunnyvale Water Pollution Control Plant (WPCP) and the Water Purification Facilities (WPF) groundwater replenishment facilities area south of the WPCP, and evaluates the potential land use and recreation impacts associated with implementation of the WPCP Master Plan (Master Plan) and the WPF.

4.2.1 Setting

4.2.1.1 Existing Land Uses within and Surrounding the Master Plan Area

The Donald M. Somers Water Pollution Control Plant is owned by the City of Sunnyvale. Existing uses within the WPCP include the approximately 16.6-acre main plant and approximately 400 acres of oxidation ponds\(^1\). The Cargill Channel, Moffett Channel, Santa Clara Valley Water District’s (District) Pond A4, Guadalupe Slough, and the San Francisco Bay Trail also are adjacent to Ponds 1 and 2.

The surrounding dry land area is primarily used for industrial and recreational purposes: the Sunnyvale Materials Recovery and Transfer Station (SMaRT Station®) abuts the main plant to the east; the Sunnyvale Landfill (now closed and traversed by numerous trails) surrounds the main plant on the landward side (west, south, and east). A short portion of the Bay Trail jogs inland just west of the main plant, with access provided via the western terminus of Carl Road. The Sunnyvale West Channel forms the main plant’s western boundary; the Sunnyvale East Channel borders the landfill farther east. The Don Edwards San Francisco Bay National Wildlife Refuge (Don Edwards National Wildlife Refuge), which encompasses portions of the South Bay Salt Ponds project, surrounds Ponds 1 and 2 and SCVWD Pond A4.

Figure 4.2-1 shows the location of existing uses and facilities within and in the vicinity of the WPCP. An overview of existing land uses follows.

Main Plant

The main plant contains the facilities comprising primary and secondary treatment and filtration and disinfection processes; other support facilities; and various buildings housing administration and maintenance. Refer to Section 2.1.2, WPCP Operations, and Figure 2-1 (WPCP Water Treatment Process) for details regarding the existing WPCP facilities and operations.

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\(^1\) Oxidation ponds are bodies of wastewater where the growth of algae and microorganisms is promoted so these organisms consume solids and nutrients in the water.
Figure 4.2-1

Land Uses and Recreational Resources in the WPCP Vicinity

SOURCE: H.T. Harvey & Associates; adapted by ESA
Ponds 1 and 2

Ponds 1 and 2 are currently used during the secondary treatment process. Pond 1 is located approximately 1,800 feet north of the main plant and Pond 2 is located approximately 670 feet northwest of the main plant. Each pond is approximately 4 feet deep and together the ponds have a total surface area of approximately 400 acres. The City of Sunnyvale/City of San José boundary bisects the ponds, so a portion of the ponds are located in San José. State law and judicial interpretation of state law mutually exempt cities from complying with each other’s building and zoning ordinances and, for extraterritorial property, consistency determinations with general plans are advisory rather than binding. The ponds are man-made features constructed and operated for the express purpose of protecting water quality and the beneficial uses of adjacent waterways.

SMaRT Station®

The SMaRT Station® is located adjacent to and east of the main plant. The SMaRT Station® is owned by the City of Sunnyvale and is operated by Bay Counties Waste Services under a contract that expires in 2021. The facility currently serves the cities of Sunnyvale, Mountain View and Palo Alto. The station includes a one-story building that accepts and handles wastes and source-separated recyclable materials delivered by the franchised haulers serving the three cities and by the general public. Current operations include sorting of recyclable materials, a buy back center for California Redemption Value bottles and cans, and providing compost and wood mulch at no charge to residents of Los Altos, Sunnyvale, Mountain View, and Palo Alto. Unrecycled residues are transferred by truck to the Kirby Canyon Landfill in San José for disposal.

Landfill

The Sunnyvale Landfill, now closed, is located near the intersection of Borregas Avenue and Caribbean Drive. The landfill property consists of four separate “hills” that abut the WPCP to the west and south, and the SMaRT Station® to the south and east. The site is designated as a Class III Landfill and was used for disposal of non-hazardous residential, commercial, and industrial municipal solid waste and construction debris until 1993, when it ceased operation. The landfill property is maintained as non-irrigated open space and is vegetated with annual and perennial grasses. Most areas are designated for public recreational uses such as hiking, birdwatching, photography and running. Pedestrian trails have been maintained in the open space areas of the landfill. The City leases the top deck area of the easternmost landfill hill to a concrete crushing/recycling company. A seven-acre biosolids monofill is also located on the closed landfill. It typically is used for disposal of digester solids from periodic digester cleanings. No change in the use of the monofill is proposed as part of the Master Plan or WPF. An area of the landfill south of the main plant across Carl Road was formerly used by the City as a curbside recycling processing facility. This facility is gated and fenced and used for storage of materials used during the City’s

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2 California Government Code Section 53091 et seq. and Section 65402(b), Government Code Section 53091 et seq. and Section 65402(c) provide similar exemptions for districts such as the Santa Clara Valley Water District for projects like the Water Purification Facilities (i.e., those involved in the production, generation, storage, treatment or transfer of water).
4. Environmental Setting, Impacts, and Mitigation Measures

4.2 Land Use and Recreation

postclosure landfill maintenance activities, and through June 2015 was also leased to the County of Santa Clara for monthly Household Hazardous Materials drop-off events.

**Channels**

The Cargill Channel and the Moffett Channel are located adjacent to and north of the main plant, respectively (see Figure 4.2-1). The Cargill Channel is now part of the Don Edwards National Wildlife Refuge, described below. The Moffett Channel covers an area of roughly 12.4 acres and functions as a conveyance channel for stormwater delivered from the Sunnyvale West Channel to be conveyed to the South Bay. The Sunnyvale East and West channels were constructed by the District in the 1960’s to provide flood protection. The Sunnyvale East and West channels currently function as engineered water conveyance channels that collect and transport stormwater runoff from urban areas in the cities of Sunnyvale and Cupertino to the southern portion of the San Francisco Bay. These surface water drainages, which are managed by the District, discharge to Moffett Channel and Guadalupe Slough and, ultimately, to the Bay.

**SCVWD Pond A4**

The SCVWD Pond A4 is located northeast of the main plant. The approximately 310-acre pond is a former Cargill Inc. salt evaporator pond. Although the District purchased Pond A4 to provide tidal wetland mitigation for stream maintenance and flood protection projects, complications (e.g., subsidence within the pond) caused the District to abandon that approach to fulfilling its mitigation obligation (which was met through another restoration project). Currently the District has no plans for SCVWD Pond A4. The District currently operates the pond to maintain water elevations and monitors water quality (e.g., salinity, dissolved oxygen and temperature).

**Guadalupe Slough**

The Guadalupe Slough was formerly the mouth of the Guadalupe River, which now reaches the Bay through Alviso Slough approximately one mile to the north (Santa Clara Valley Water District, 2013a). The Guadalupe Slough is located north of Ponds 1 and 2, and extends northwest through the salt flats to the south end of San Francisco Bay.

**Don Edwards National Wildlife Refuge**

The approximately 30,000-acre Don Edwards National Wildlife Refuge, operated by the U.S. Fish and Wildlife Service, surrounds Ponds 1 and 2 and SCVWD Pond A4. The refuge provides breeding and foraging habitat for many bird species. The refuge includes a variety of estuarine habitats, former salt ponds, and rare plant and animal species. Because the refuge is part of the Pacific Flyway, a major north-south route of travel for migratory birds in the Americas, numerous migrating waterbirds are in the area throughout much of the year (U.S. Fish and Wildlife Service,

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3 Information in this section is derived from the Biological Constraints and Opportunities Report prepared as part of the Sunnyvale Water Pollution Control Plant Primary Treatment Facility Project Initial Study/Mitigated Negative Declaration (SCH Number 2014112037), May 2015.
2015). The Refuge’s environmental education center is located in Alviso approximately 3.3 miles northeast of the main plant.

**Agricultural/Farmland**

None of the land at the WPCP or in the surrounding vicinity is zoned or mapped for agricultural uses. The California Department of Conservation (CDC) Santa Clara County Important Farmland 2012 map depicts the main plant and surrounding area on both sides and to the south as Urban and Built Up Land, which is defined as occupied by structures with a building density of 1.5 acres or approximately six structures to a 10-acre parcel. The area north of the main plant, including Ponds 1 and 2 and SCVWD Pond 4A, is shown as Other Lands (CDC, 2014).

### 4.2.1.2 Existing Land Uses within the Water Purification Facilities Area

The WPF would be located at the WPCP and at locations south of the WPCP (i.e., groundwater replenishment facilities area), as shown on **Figure 4.2-2**.

Existing recharge basins that could be used for groundwater replenishment are within the city of Campbell and are part of the Los Gatos Groundwater Recharge System, near the intersection of State Routes 17 and 85. Injection wells would be sited within an area roughly bordered by State Route 85, San Tomas Aquino Creek, and Calabazas Creek. Pipeline alignments between the WPCP, the injection well siting area and the recharge basins have not been determined but could be located in the cities of Sunnyvale, San Jose, Campbell, Cupertino, Saratoga, and/or Santa Clara. The existing land uses for the WPCP are described above. The land uses associated with the proposed groundwater replenishment facilities area are described below.

**Purified Water Pipeline**

Pipeline alignments would be located between the WPCP, the injection well siting area, and the recharge basins (refer to Figure 3-12 in Chapter 3). As planning progresses the District would confirm whether existing pipelines would be repurposed for conveying the purified water to the injection wells and recharge basins, or whether a new pipeline or pipelines would be constructed. If a new pipeline is required, construction would mostly likely occur within existing public streets. Transportation networks typically have designations that include Highway/Freeway, Expressway, Arterial, Major Streets, Boulevard, Connector, and Local Streets.

**Injection Wells**

Injection wells could be sited in an area roughly bordered by State Route 85, San Tomas Aquino Creek, and Calabazas Creek (refer to Figure 3-12). Although no specific sites would be identified until engineering feasibility studies are completed, preliminary land uses of sites considered to date include open space, parks, public-use (i.e., schools), and residential parcels.
Cities Near the WPCP and Water Purification Facilities

SOURCE: Caltrans, 2014
4. Environmental Setting, Impacts, and Mitigation Measures

4.2 Land Use and Recreation

Recharge Basins

The Los Gatos Groundwater Recharge System consists of percolation ponds (recharge basins) along Los Gatos Creek in Campbell (refer to Figure 3-12). The ponds are designated as Percolation Ponds in the City of Campbell General Plan and are adjacent to open space areas (City of Campbell, 2014).

Agricultural/Farmland

Important Farmland. Parcels of land within Santa Clara County that are mapped for agricultural uses are shown on the CDC Santa Clara County Important Farmlands 2012 map. Important farmlands are classified in the categories listed below on the basis of soil conditions (their suitability for agriculture) and current land use.

- **Prime Farmland**: This category represents farmland with the best combination of physical and chemical characteristics for long-term agricultural production. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed. In addition, the land must have been used for irrigated agricultural production in the last four years to qualify under this category.

- **Farmland of Statewide Importance**: Farmland of Statewide Importance is similar to Prime Farmland in that it has a good combination of physical and chemical characteristics for crop production, but with minor shortcomings, such as greater slopes and less ability to store moisture.

- **Unique Farmland**: This category applies to land that does not meet the criteria for Prime Farmland or Farmland of Statewide Importance but has been used for the production of the state’s leading agricultural crops. This land is usually irrigated, but the category may include non-irrigated orchards or vineyards, as found in some climatic zones of California. Unique Farmland must have been cropped at some time during the four years prior to the mapping date.

- **Farmland of Local Importance**: This category applies to land including small orchards and vineyards primarily in the foothill areas. This category also includes lands cultivated as dry croplands for grains and hay (CDC, 2014).

While almost all of the area south of the WPCP in the general vicinity of the groundwater replenishment facilities is mapped as Urban and Built Up, two parcels in the city of Sunnyvale south of the WPCP are mapped as Unique Farmland and one parcel in the city of Santa Clara is mapped as Farmland of Local Importance. The first parcel mapped Unique Farmland is located along Lawrence Expressway between Redd Avenue and El Camino Real. The other parcel mapped as Unique Farmland is the Heritage Park Orchard site, located at 180 Elm Court. The parcel mapped as Farmland of Local Importance is located along Winchester Boulevard between Worthing Circle and Dorchic Street.

Williamson Act Program. The California Land Conservation Act (commonly referred to as the Williamson Act) is the state’s primary program for the conservation of private land for agricultural and open space uses. The CDC prepares countywide maps of lands enrolled in Williamson Act contracts and classifies them into the categories described below.
4. Environmental Setting, Impacts, and Mitigation Measures
4.2 Land Use and Recreation

- **Prime Agricultural Land**: This category represents the state’s highest-quality agricultural land. Land in this category is typically used for the production of irrigated crops or to support livestock.

- **Non-Prime Agricultural Land**: This category represents Open Space Land of Statewide Significance as defined under the California Open Space Subvention Act. Most land under this category is in agricultural uses such as grazing or non-irrigated crops, and may also include other open space uses that are compatible with agriculture and consistent with local general plans.

- **Mixed Enrollment Agricultural Land**: This category includes lands containing a combination of Prime, Non-Prime, Open Space Easement, or other contracted or enrolled lands not yet delineated by the county.

- **Land in Non-renewal**: This category represents land under contracts that are being terminated at the option of the landowner or local government.

There is one parcel (one of the aforementioned parcels designated as Unique Farmland) within the groundwater replenishment facilities area that is designated as **Prime Agricultural Land**, located along Lawrence Expressway between Redd Avenue and El Camino Real in the City of Sunnyvale. No other lands within the groundwater replenishment facilities area are enrolled in the Williamson Act Program (CDC, 2013).

### 4.2.1.3 Recreational Resources

**Master Plan**

Figure 4.2-1 shows the recreational resources near the WPCP.

**San Francisco Bay Trail**

In 1987, Senate Bill 100 was passed into law directing the Association of Bay Area Governments (ABAG) to create a trail/recreational corridor that was to be aligned along the Bay. The Bay Trail is a multi-purpose recreational trail that, when complete, will encircle San Francisco Bay and San Pablo Bay with a continuous 500-mile network of bicycling and hiking trails. The Bay Trail will connect the shoreline of all nine Bay Area counties in the region. The Bay Trail provides opportunities for walking, jogging, and bicycling. The Bay Trail offers access to commercial, industrial, and residential neighborhoods, points of historic, natural and cultural interest, recreational areas such as beaches, marinas, fishing piers, boat launches, and over 130 parks and wildlife preserves (ABAG 2015). Within the project area, there is an existing entrance to the Bay Trail at the west end of Carl Road. This segment of the Bay Trail borders the WPCP to the west and north and surrounds Ponds 1 and 2.

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4 Information in this section is derived from San Francisco Bay Trail: Overview and About. Last Accessed May 27, 2015. Available at: http://baytrail.abag.ca.gov/aboutus.html
Other Trails near the WPCP

As described above and shown in Figure 4.2-1, the City maintains pedestrian trails in the open space areas of the closed landfill property adjacent to the WPCP.

Moffett Channel

Moffett Channel, located north of the main plant, extends from approximately the back of the SMaRT Station® along the east side of Ponds 1 and 2 to Guadalupe Slough. Moffett Channel functions as a conveyance channel, delivering stormwater from the Sunnyvale West Channel to Guadalupe Slough and ultimately the South Bay. During duck hunting season, which generally starts around the third week in October and lasts for 100 days, Moffett Channel and Guadalupe Slough (as well as the Don Edwards National Wildlife Refuge) are popular with recreational duck hunters. Hunters can access Moffett Channel via Carl Road adjacent to the WPCP, and within the channel hunt from boats or on foot (City of Sunnyvale, 2014).

Twin Creek Sports Complex

The Twin Creeks Sports Complex is located approximately 0.6 mile east of the main plant. The 60-acre sports complex is leased and operated by a private company, and offers 10 lighted softball fields, batting cages, volleyball courts, tournament headquarters, and other amenities.

Sunnyvale Baylands Park

Baylands Park is located approximately 1 mile southeast of the main plant, southeast of Twin Creek Sports Complex. Baylands Park consists of approximately 72 acres of developed parkland offering active recreation, pathways and picnic areas. The City manages and maintains Baylands Park under agreement with Santa Clara County. An additional 105 acres of seasonal wetlands adjacent to the park is a protected Wetlands Preserve, providing habitat for plants and wildlife. A segment of the Bay Trail borders the park to the east and north. This segment of the trail connects to the portion that is located adjacent to the WPCP.

Bicycle Routes

Within the WPCP service area there are several routes available for bicycle commuters and recreationists, as well as more general bicycle travel. Class I bicycle routes are paths providing a completely separated right of way for the exclusive use of bicycles and pedestrians, Class II bicycle routes include on-street bike lanes, and Class III bicycle routes provide for shared use with pedestrian or motor vehicle traffic. In the vicinity of the Master Plan area, there are Class II bike routes along Caribbean Drive.

Water Purification Facilities

San Francisco Bay Trail

Within the groundwater replenishment facilities area, there are three separate trails that extend from the Bay Trail to the south. One portion extends to San Tomas Expressway, another follows
the Lower Guadalupe River Trail to approximately State Route 87, and the last portion extends along Coyote Creek to Montague Expressway.

**Other Trails**

There are other recreational trails located adjacent to waterways throughout the groundwater replenishment facilities area including the Guadalupe River Trail, San Tomas-Aquino Trail, Los Gatos Creek Trail, and the Coyote Creek Trail.

**Parks/Open Space**

Throughout the groundwater replenishment facilities area there are numerous public/recreational uses, including areas of open space, regional and local parks, riparian corridors, and outdoor recreation facilities (i.e., sports fields). Many of the open space/parks are located adjacent to waterways.

**Bicycle Routes**

Within the groundwater replenishment facilities area, bicycle use areas are designated on various roadways, including Class I, Class II, and Class III routes.

### 4.2.2 Regulatory Setting

#### 4.2.2.1 Federal Regulations

**The Farmland Protection and Policy Act**

The Farmland Protection and Policy Act requires an evaluation of the relative value of farmland that could be affected by decisions sponsored in whole or part by the federal government. The Farmland Protection and Policy Act does not apply to the proposed project because the project is not a federal government action or program.

#### 4.2.2.2 State Regulations

**Williamson Act**

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is the state’s primary program aimed at conserving private land for agricultural and open space use. It is a voluntary, locally administered program that offers reduced property taxes on lands whose owners place enforceable restrictions on land use through contracts between the individual landowners and local governments.

As noted above, there is one parcel within the WPF groundwater replenishment area that is under a Williamson Act contract.
Postclosure Land Use Regulations for Landfills

California Code of Regulations (CCR) Title 27, Division 2, Section 21190, regulates land uses on and near closed landfills. Postclosure land uses must be designed and maintained to protect public health and prevent damage to the closed landfill’s monitoring and control systems. Section 21190(c) requires that all proposed postclosure land uses, other than non-irrigated open space, be submitted to the Local Enforcement Agency (LEA), RWQCB, local air district and local land use agency and that the LEA must review and approve proposed postclosure land uses if the project involves structures within 1,000 feet of the disposal area, structures on top of waste, modification of the low permeability layer, or irrigation over waste. Title 27 Section 21769 requires that the landfill operator prepare and submit for approval a closure and postclosure maintenance plan that, among other required contents, describes proposed postclosure land uses. Pursuant to Section 21890, significant changes to an approved plan must be approved by the LEA, RWQCB, and the California Department of Resources Recycling and Recovery (CalRecycle); postclosure plans may be revised during the postclosure maintenance period upon concurrence with the LEA and approval by CalRecycle and the RWQCB. The LEA in Santa Clara County is the Santa Clara County Department of Environmental Health (SCCDEH).

California Fish and Game Code

The California Fish and Game Code regulates recreational hunting. Section 2016 prohibits hunters from discharging any firearm or taking or destroying any mammal or bird, including any waterfowl from city property, regardless of where the hunting took place so long as signs are posted forbidding trespass or hunting, or both. Signs regarding hunting restrictions are posted along the levees and trails adjacent to Moffett Channel and Ponds 1 and 2.

San Francisco Bay Conservation and Development Commission and the San Francisco Bay Plan

The San Francisco Bay Plan (Bay Plan) was prepared by the San Francisco Bay Conservation and Development Commission (BCDC) from 1965 through 1969 and amended through 2012 in accordance with the McAteer-Petris Act (BCDC, 2012). The Bay Plan guides the protection and use of the Bay and its shoreline. BCDC has permit jurisdiction over all areas of the Bay subject to tidal action, which is defined by the shoreline up to the mean high tide line (including all sloughs, tidelands, submerged lands, and marsh areas), as well as salt ponds, managed wetlands, certain waterways designated in the McAteer-Petris Act and BCDC regulations, and the land lying between the shoreline and a line parallel to, and 100 feet landward of, the shoreline, known as the 100-foot shoreline band. Under the McAteer-Petris Act, the Bay Plan provides policy direction for BCDC’s permit authority regarding the placement of fill, extraction of materials; substantial changes in use of land, water, or structures within its jurisdiction; protection of the Bay habitat and shoreline; and public access to the Bay. Although the waters of Ponds 1 and 2 are not subject to BCDC’s Bay jurisdiction the way tidal waters are, any activities within 100 feet of Guadalupe Slough, Moffett Channel, and the tidal wetlands along the slough and channel are subject to BCDC’s shoreline band.

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\[5\] Title 27 regulations refer to the California Integrated Waste Management Board, which is now CalRecycle.

\[6\] In marsh areas the shoreline is defined as five feet above mean sea level rather than the mean high tide line.
4. Environmental Setting, Impacts, and Mitigation Measures
4.2 Land Use and Recreation

jurisdiction. A BCDC permit would be needed for components of the Master Plan that fall within
BCDC’s jurisdiction, including diurnal equalization and storage, restoration of Ponds 1 and 2
(breaching of levees), relocated Bay Trail access, and improvements along the northern and western
boundaries of the main plant. Figure 4.2-3 presents the expected BCDC jurisdictional boundary
within the vicinity of the WPCP. BCDC policies related to land use and recreation that are relevant to
the Master Plan include the following (BCDC, 2012, pages 61, 64, 68, 69):

- **Recreation Policy 3**: Recreational facilities, such as waterfront parks, trails, marinas, live-
  aboard boats, non-motorized small boat access, fishing piers, launching lanes, and beaches,
  should be encouraged and allowed by the Commission, provided they are located, improved and
  managed consistent with the standards in the Bay Plan.

- **Recreation Policy 4(a)(6)**: Trails that can be used as components of the San Francisco Bay
  Trail, the Bay Area Ridge Trail or links between them should be developed in waterfront
  parks. San Francisco Bay Trail segments should be located near the shoreline unless that
  alignment would have significant adverse effects on Bay resources; in this case, an
  alignment as near to the shore as possible, consistent with Bay resource protection, should
  be provided. Bay Area Ridge Trail segments should be developed in waterfront parks
  where the ridgeline is close to the Bay shoreline.

- **Recreation Policy 4(a)(7)**: Bus stops, kiosks and other facilities to accommodate public
  transit should be provided in waterfront parks to the maximum extent feasible. Public
  parking should be provided in a manner that does not diminish the park-like character of
  the site. Traffic demand management strategies and alternative transportation systems
  should be developed where appropriate to minimize the need for large parking lots and to
  ensure parking for recreation uses is sufficient.

- **Public Access Policy 2**: In addition to the public access to the Bay provided by waterfront
  parks, beaches, marinas, and fishing piers, maximum feasible access to and along the
  waterfront and on any permitted fills should be provided in and through every new
  development in the Bay or on the shoreline, whether it be for housing, industry, port,
  airport, public facility, wildlife area, or other use, except in cases where public access
  would be clearly inconsistent with the project because of public safety considerations or
  significant use conflicts, including unavoidable, significant adverse effects on Bay natural
  resources. In these cases, in lieu access at another location preferably near the project
  should be provided.

- **Public Access Policy 3**: Public access to some natural areas should be provided to permit
  study and enjoyment of these areas. However, some wildlife are sensitive to human
  intrusion. For this reason, projects in such areas should be carefully evaluated in
  consultation with appropriate agencies to determine the appropriate location and type of
  access to be provided.

- **Public Access Policy 5**: Public access should be sited, designed, managed and maintained to
  avoid significant adverse impacts from sea level rise and shoreline flooding.

- **Public Access Policy 7**: Public access improvements provided as a condition of any approval
  should be consistent with the project and the physical environment, including protection of
  Bay natural resources, such as aquatic life, wildlife and plant communities, and provide for
  the public’s safety and convenience. The improvements should be designed and built to
Sunnyvale Water Pollution Control Plant Master Plan

Figure 4: Expected BCDC Jurisdiction

LEGEND
- BCDC Jurisdiction (Tidal Areas)
- Possible BCDC Jurisdiction (Former Salt Ponds)
- BCDC Jurisdiction (100-ft Shoreline Band)

Background: USDA 2009 NAIP Aerial

SOURCE: H.T. Harvey, 2014

Figure 4.2-3
Expected BCDC Jurisdiction
encourage diverse Bay-related activities and movement to and along the shoreline, should permit barrier free access for persons with disabilities to the maximum feasible extent, should include an ongoing maintenance program, and should be identified with appropriate signs.

- **Public Access Policy 9:** Access to and along the waterfront should be provided by walkways, trails, or other appropriate means and connect to the nearest public thoroughfare where convenient parking or public transportation may be available.

### 4.2.2.3 Local Plans and Policies

#### Master Plan

**City of Sunnyvale General Plan**

The Sunnyvale General Plan (City of Sunnyvale, 2011) was assembled and consolidated in 2011 from 22 General Plan elements and sub-elements that had been adopted at different times; the consolidated General Plan was adopted in July 2011. The City is currently updating the Land Use and Transportation Element (LUTE), which is tentatively scheduled to be published in Spring 2016 (City of Sunnyvale, 2015). The main plant is designated in the General Plan as Environmental Services. The proposed location of the Administration Building is designated as Parks. Except for the SMaRT Station®, which is designated Environmental Services, the closed landfill adjacent to the WPCP to the west, south and east is also designated as Parks (City of Sunnyvale, 2013). The General Plan discussion of the closed landfill recognizes its value as an open space area with walking trails and maintenance roads that are heavily used for lunch-time recreation by employees of nearby companies.

The Sunnyvale General Plan establishes the policy framework that serves as the City’s basis for decision-making, and guides the community’s near-term and long-range development. The goals and policies of the General Plan reflect the City’s philosophy on development and provide guidance for making decisions on related issues. Land use and recreation policies that are relevant to the proposed Master Plan include the following (City of Sunnyvale, 2011, pages 3-6 to 3-10, 3-43):

- **Policy LT -1.11:** Protect regional environmental resources through local land use practices.
  
  - **LT-1.11b:** Protect and preserve the diked wetland areas in the Baylands, which serve as either salt evaporation ponds or holding ponds for the wastewater treatment plant.

- **Policy LT -2.1** Recognize that the City is composed of residential, industrial and commercial neighborhoods, each with its own individual character; and allow change consistent with reinforcing positive neighborhood values.

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7 Section 4.7, Biological Resources, addresses Santa Clara County’s Santa Clara Valley Habitat Plan as it relates to the Master Plan and WPF.

8 According to the Notice of Preparation for the EIR that is being prepared for the LUTE update, the recommended General Plan land use designation for the area north of Caribbean Drive in the vicinity of the WPCP, including the main plant, closed landfill, SMaRT Station®, and location of the proposed Administration Building, is Public Facilities; such a change in the land use designation would be consistent with current zoning. Until the updated LUTE is adopted the recommended land use designations are subject to change.
• **Policy LT-2.2:** Encourage nodes of interest and activity, such as parks, public open spaces, well planned development, mixed use projects and other desirable uses, locations and physical attractions.
  - **LT-2.2d:** Maintain public open space areas and require private open space to be maintained.

• **Policy LT-9.4:** Support a regional trail system by coordinating with adjacent jurisdictions to facilitate trail connections wherever possible.

• **Council Policy Manual - Goal 3.2H:** Manage the closed Sunnyvale Landfill in a manner that protects the public health and safety and the environment, promotes enjoyable public use of the site, and assists in the achievement of other goals of the Environmental Management Solid Waste section.

• **Policy SN-3.2:** Control conduct recognized as threatening to life and property.

The *Sunnyvale General Plan* also contains policies related to maintaining and updating existing treatment operations at the WPCP:

• **Policy EM-5.1:** Water Pollution Control Plant improvements should be designed, constructed and maintained and the quantity of industrial wastes should be controlled so that the plant does not have to be expanded in excess of its capacity of 29.5 MGD.

• **Policy EM-7.1:** Monitor Water Pollution Control Plant operations and maintenance to meet regulatory standards.

• **Policy EM-7.4:** Produce quality recycled water and seek to maximize the use of this resource.
  - **EM-7.4a:** Study feasibility of recycled water for restoration and/or enhancement of marshlands.

### City of Sunnyvale Zoning Code

The WPCP, including the main plant and oxidation ponds, and areas north of Caribbean Drive west, south, and east of the main plant are zoned *P-F (Public Facility)* in the Sunnyvale Zoning Code (Title 19 of the City’s Municipal Code). The *P-F* district is reserved for the construction, use and occupancy of governmental, public utility and educational buildings and facilities, and other uses compatible with the public character of the district. Public utility buildings and service facilities are conditionally permitted under this zoning district.

### City of Sunnyvale Municipal Code

The City of Sunnyvale Municipal Code includes the following sections relevant to recreational hunting: Sunnyvale Municipal Code (SMC) Section 9.44.010 (Discharge of firearms prohibited) and Section 9.62.020 (i) (Misuse of park property).

### Sunnyvale Citywide Design Guidelines

The *Citywide Design Guidelines* were adopted by City Council on June 23, 1992 and most recently amended on April 8, 2014. The guidelines are applied to areas within the City that do not have
specific design guidelines. They are based on General Plan goals and policies and mainly address development projects on private properties. The guidelines are intended to enhance the overall image of the City, protect and preserve the existing character of the community, communicate the image the community desires and achieve a higher design quality. The project would be required to comply with the guidelines including site design considerations such as locating noise and odor generating functions so that they do not create a nuisance for the adjacent and nearby properties.

City of Sunnyvale Bicycle Plan

The City of Sunnyvale 2006 Bicycle Plan (Korve Engineering, 2006) continues Sunnyvale’s development of bicycling infrastructure, practices, and policies. The goals of the City’s bicycle program include continued build-out of the bikeway network to facilitate commute and recreational trips, development of additional policies and standards to support bicycling in city government and at workplaces, enhancement of education options and their availability for both bicyclists and motorists, and continuation of effective law enforcement. The existing bicycle routes in the Master Plan vicinity are on Caribbean Drive as described above. The bicycle plan identifies opportunities to enhance the city’s bikeway network by constructing segments of bicycle trail along the Sunnyvale East Channel, including two segments in the vicinity of the WPCP, although they are not included as capital improvement program projects in the plan. The Plan also contains a stated goal to evaluate the feasibility of developing the West Channel as a pathway that could connect to the Bay Trail, but no capital improvement program projects are associated with this goal. One of these East Channel segments was identified in the District’s 2013 Sunnyvale East and West Channels Flood Protection Project and is included in the cumulative analysis presented in Chapter 6 (see Table 6-1).

Sunnyvale Landfill Closure and Postclosure Maintenance Plan

The purpose of landfill closure and postclosure maintenance plans is to ensure that landfill closure and postclosure maintenance and the eventual reuse of disposal sites conform to state performance standards and minimum requirements. As described above in Section 4.2.2.2, the plans must describe the planned uses of the property during the postclosure period and be submitted to the SCCDEH, RWQCB, local air district, and local land use agency. The first approved plan for the landfill was the 1992 Sunnyvale Landfill Closure and Postclosure Maintenance Plan. That plan was updated in 2012 by the City of Sunnyvale Landfill Postclosure Maintenance Plan, to provide detailed plans for continued inspection, maintenance and monitoring of the landfill and updated cost estimates for the demonstration of postclosure financial assurance (SCS Engineers, 2012). The updated 2012 plan indicates that the recreational and recycling uses at the site were expected to continue throughout the postclosure period. The 2012 plan did not anticipate changes in use of the area proposed in the Master Plan as the site for a new Administration Building, which was used at the time for storage of materials used during the City’s postclosure maintenance activities and leased to Santa Clara County for monthly Hazardous Materials drop off events.

Although the site of the proposed Administration Building appears to be outside the landfill area to the south, east and west, the general area was used for waste disposal since the 1920s, and recent testing has identified landfill waste beneath the Administration Building site (as described in Section 4.8, Geology, Soils, Seismicity, and Mineral Resources).
4.2 Land Use and Recreation

Water Purification Facilities

Table 4.2-1 lists the General Plan Land Use designation and zoning for the cities within which the groundwater replenishment facilities (recharge basins and injection wells) are and could be located. General Plan designations and zoning is not included for pipelines because no alignments have been identified.

<table>
<thead>
<tr>
<th>WPF Infrastructure</th>
<th>San Jose General Plan</th>
<th>San Jose Zoning</th>
<th>Saratoga General Plan</th>
<th>Saratoga Zoning</th>
<th>Campbell General Plan</th>
<th>Campbell Zoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injection Wells</td>
<td>CR, CFS, M-12.5, OS-OR, PA, RMF, M-10, PDR</td>
<td>R-1, PA, R-M, CN</td>
<td>Low Density Residential, Open Space, Low Medium Density Residential, Medium Density Residential, Institutional</td>
<td>R-1, R-1-9, R-1-8, R-P-D, R-2, R-3, P-F, PF/OS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recharge Basins</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Percolation Ponds</td>
<td>Percolation Ponds</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
- N/A-Not Applicable
- R-1-8-Residence District
- R-1-Single Family Residential
- R-M [San Jose]-Residence District (Multi-unit/Lot)
- PDR-Planned Development Residential
- R-M [Saratoga]-Multi-Family Residential
- R-1-X-Single Family Residential
- PA-Professional & Administrative
- P-D-Planned Development
- RMF-Multi-family Residential
- P-F-Planned Development
- PF/OS-Public Facilities/Open Space
- CN-Commercial Neighborhood
- P-D-Planned Development
- M-10, M-12.5-Medium Density Residential
- P-D-Planned Development
- CFS-Community Facility
- P-F-Planned Development
- RMF-Multi-family Residential
- P-F-Planned Development
- OS-OR-Open Space-Outdoor Recreation
- OS-OR-Open Space-Outdoor Recreation
- CR-Commercial Retail
- CR-Commercial Retail
- CO-Commercial Office District
- CO-Commercial Office District
- MUN-Mixed Use Neighborhood
- MUN-Mixed Use Neighborhood
- RN-Residential Neighborhood
- RN-Residential Neighborhood
- OSPH-Open Space, Parklands and Habitat
- OSPH-Open Space, Parklands and Habitat
- CP-Commercial Pedestrian District
- CP-Commercial Pedestrian District
- CR-Commercial Retail
- CR-Commercial Retail
- A(PD)-Planned Development
- A(PD)-Planned Development

SOURCES: City of Campbell, 2013, 2014; City of San José 2011, 2015; City of Saratoga, 2010a, 2010b.

4.2.3 Impacts and Mitigation Measures

4.2.3.1 Thresholds of Significance

For the purposes of this EIR, a land use and recreation impact is considered significant if implementation of the proposed project would result in any of the following:

Land Use
- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.
• Conflict with existing zoning for agricultural use, or a Williamson Act contract.

• Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

• Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)).

• Result in the loss of forest land or conversion of forest land to non-forest use.

**Recreation**

• Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facility would occur or be accelerated.

• Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

**4.2.3.2 Approach to Analysis**

This section addresses land use and recreation issues associated with construction and operation of the proposed Master Plan WPCP improvements or the WPF with regard to the significance criteria identified above. For the reasons described below, there would be no impacts related to the following criteria:

**Threshold of Significance: Would the project physically divide an established community?**

None of the proposed improvements under the Master Plan would divide an existing established community because the WPCP is an existing use. Therefore, this significance criterion does not apply to the Master Plan.

If new pipelines are required for the WPF, the pipelines would be constructed underground. Injection well would require concrete pads roughly 400 square feet and spaced at least 1,500 feet apart. For purposes of analysis, it is assumed that the facility would occupy a property of between 5,000 and 10,000 square feet. Based on the size and scale of the well sites and the proposed use, siting the injection wells within the proposed well siting area would not be expected to divide an established community. The recharge basins already exist and are used for purposes of groundwater replenishment. Therefore none of these facilities would divide an established community and this significance criterion does not apply to the WPF.

**Threshold of Significance: Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?**

There is no forest land within the Master Plan or WPF areas; thus, implementation and operation of the Master Plan and WPF would not conflict with zoning regulations for forest land. Therefore, this significance criterion does not apply to the Master Plan or WPF.
4. Environmental Setting, Impacts, and Mitigation Measures

4.2 Land Use and Recreation

Threshold of Significance: Would the project result in the loss of forest land or conversion of forest land to non-forest use?

As described above, there is no forest land within the WPCP or WPF area; thus implementation and operation of the Master Plan would not result in the loss of forest land, or result in the conversion of forest land to non-forest use. Thus, this significance criterion does not apply to the Master Plan or the WPF.

Thresholds of Significance: Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

There are no lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance within the vicinity of the WPCP. Therefore, implementation of the Master Plan would not result in the conversion of designated Farmland, as shown on the maps pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use. In addition, the Master Plan would not result in a zoning conflict for agricultural uses or with an existing Williamson Act contract. For these reasons, there would be no impact to agricultural resources with implementation of the Master Plan and this significance criterion does not apply to the Master Plan.

As noted above, there are no lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance within the vicinity of the WPCP, therefore new facilities at the WPCP associated with the WPF would not impact agricultural resources. As described in Section 4.2.1.2, there are three parcels designated as farmland (two as unique farmland and one as farmland of local importance) in the general area between the WPCP and the location of the proposed injection wells and existing recharge basins; one of these parcels is enrolled under a Williamson Act contract (in an area designated as Low Medium Density Residential in the Sunnyvale General Plan). These parcels are located outside both the injection well siting area and the location of the existing recharge basins, so these WPF groundwater replenishment facilities would not affect agricultural resources. These parcels are located within the general area where purified water pipelines could be sited. New pipelines (if needed) are assumed to be constructed in existing public streets, and once constructed the pipelines would be buried underground and all disturbed/graded areas would be returned to pre-construction conditions. Therefore, it is not anticipated that WPF pipelines would affect the land use restrictions imposed by the Williamson Act contract on this parcel or otherwise affect existing uses of the parcels designated as farmland. Therefore, these significance criteria do not apply to the WPF and these criteria are not discussed further.

Would the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

The Master Plan includes relocation of an existing access point to the San Francisco Bay Trail in order to accommodate the proposed improvements to the WPCP and ensure site security. Access to the Bay Trail and other neighboring trails would be moved one block,
from the west side of the WPCP at Carl Drive to an enhanced access point along Caribbean Drive at the Sunnyvale West Channel. Relocation of the access point would include converting 950 feet of one lane of Caribbean Drive to the east and west of the access location to parking in combination with grading, sidewalk, and landscaping improvements. The proposed relocation of the Bay Trail access point to Caribbean Drive is consistent with the existing trails and public recreational and open space land uses of the adjacent landfill west of the Sunnyvale West Channel and would not adversely affect nearby land uses. The existing maintenance road along the Sunnyvale West Channel used as an informal trail is contained within an easement maintained by the District, although the parcels are owned by the City of Sunnyvale (SCVWD, 2013b). Sections 4.3 to 4.16 address the impacts resulting from construction of the relocated access point; this criterion is not discussed further in this section.

4.2.3.3 Impact Summary

Table 4.2-2 lists the project’s land use and recreation impacts and significance determinations.

<table>
<thead>
<tr>
<th>Impact</th>
<th>LU-1 Consistent with Local Plans and Policies</th>
<th>LU-2 Increased Use and Deterioration of Recreation Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Plan</td>
<td>LS</td>
<td>LS</td>
</tr>
<tr>
<td>Water Purification Facilities</td>
<td>LS</td>
<td>LS</td>
</tr>
</tbody>
</table>

LS = Less than significant impact, no mitigation required.

4.2.3.4 Master Plan Impacts and Mitigation Measures

Impact LU-1: The Master Plan would be consistent with local plans and policies, a less-than-significant impact.

Pertinent land use plans addressed herein include those of the City of Sunnyvale and BCDC. The discussion below addresses general consistency of proposed land uses with these plans. Refer to Sections 4.3 to 4.16 regarding resource-specific plans and policies. Note that this discussion responds to CEQA Guidelines Section 15125(d) requirements. The board, council, or commission that enacted the plan or policy generally determines the meaning of such policies and, through approval processes, determines plan consistency.

City of Sunnyvale Land Use Plans and Policies

Proposed WPCP improvements at the main plant would occur on lands designated as Environmental Services and the new Administration Building would be located on lands designated as Parks. Because the WPCP improvements would continue to support wastewater treatment
activities, implementation of the main plant improvements would be consistent with the Environmental Services use designation in the General Plan. The new Administration Building would be located at the site formerly used for a curbside recycling processing facility and for household hazardous waste drop off events and would be consistent with General Plan policies (e.g., Policy LT-2.1) that allow for change that is consistent with the character of the area and neighboring uses. Because the new Administration Building would be consistent with the recent uses of the site and would not affect existing recreational uses of landfill trails, it would also be consistent with the General Plan designation of the landfill area south of the main plant as Parks. All proposed WPCP improvements would be consistent with existing P-F Public Facility zoning that applies to the Master Plan area.

On the whole, implementation of the Master Plan would be consistent with land use policies in the General Plan, which recognize the continuing use of this area for wastewater treatment. In addition, the Master Plan proposes improvements at the relocated access point for the Bay Trail including parking in combination with sidewalk and landscaping improvements. These improvements and maintaining the connection to existing segments of the Bay Trail would be consistent with General Plan policies to support the regional trail system. The Master Plan also includes the restoration of Ponds 1 and 2. The City proposes to explore opportunities to implement habitat restoration within the remaining area of the oxidation pond facilities, in partnership with regulatory and other agencies. Refer to Sections 4.3 to 4.16 for discussion of consistency with General Plan policies specific to environmental resources (e.g., noise).

**San Francisco Bay Plan**

As described in Section 3.6, Uses of the PEIR, components of the Master Plan fall within the jurisdiction of BCDC, including diurnal equalization and storage, restoration of Ponds 1 and 2 (breaching of levees), relocated Bay Trail access, and improvements along the northern and western boundaries of the main plant. Development of Master Plan components within BCDC jurisdiction would require a BCDC permit in conjunction with a determination by BCDC that these components were consistent with the Bay Plan. The proposed WPCP improvements would be consistent with BCDC's Bay Plan policies related to public access.

As part of the proposed improvements to the WPCP and to ensure site security, the Master Plan proposes a relocated access for the Bay Trail, including converting one lane of Caribbean Drive to the east and west of the relocated access to parking, in combination with sidewalk and landscaping improvements. The proposed relocated access would connect to existing segments of the Bay Trail. These areas are already accessible to the public with parking and access via public transportation. The proposed relocated access to the Bay Trail and associated improvements would be designed in accordance with pertinent engineering and building codes to accommodate access for all persons. The relocated access would include signage designating the location. The relocated access to the Bay Trail along Caribbean Drive would enable recreationists to experience the natural areas associated with the trail that currently encompasses Ponds 1 and 2. The Master Plan also proposes enhancements to the access point for the Bay Trail, as described above.
During construction, existing access to the Bay Trail within the vicinity of the WPCP would be disrupted, including temporary closure of the trail along the existing berm adjacent to the ponds. Detour routes would be designated with signage along the disrupted and closed portions of the Bay Trail. These detours would be temporary in nature and only occur during certain construction activities.

**Sunnyvale Landfill Postclosure Maintenance Plan**

The proposed Administration Building is within the approximate site boundary of the Sunnyvale Landfill, within the footprint of the former household hazardous waste drop off facility; the site is underlain by waste. Use of this area for an Administration Building is not included in the landfill’s current postclosure maintenance plan; consequently, the Administration Building may be considered inconsistent with the current plan. The SCCDEH may require that the City update the postclosure maintenance plan to reflect this proposed use. Updating the plan would eliminate a potential inconsistency with the postclosure maintenance plan and would ensure that construction and operation of the Administration Building is consistent with requirements of CCR Title 27 regarding, for example, postclosure use provisions. Regarding foreseeable physical environmental impacts related to construction on landfilled material, refer to Sections 4.8, Geology, Soils, Seismicity, and Mineral Resources; and 4.11, Hazards and Hazardous Materials.

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**Impact LU-2: The Master Plan would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated, a less-than-significant impact.**

Recreational resources in the vicinity of the proposed WPCP improvements include the Baylands Park, Twin Creek Sports Complex, and a Class II bike route. The Baylands Park is located approximately 1 mile southeast of the Master Plan area and a segment of the Bay Trail from the park connects to the portion of the trail that is located adjacent to the WPCP. The Twin Creek Sports Complex is located approximately 0.6 east of the Master Plan area, and the Class II bike facility is located along Caribbean Drive, south of the WPCP facility. Construction activities associated with the WPCP improvements would not affect nearby recreational resources. The parks would remain open and are located far enough away from the proposed WPCP facility that improvements would not affect the park facilities. Operations under the Master Plan would not affect the Class II bike route and recreationists who utilize this bike route are assumed to be accustomed to the industrial nature of the vicinity. Potential temporary effects on the bike lane during construction are addressed in Section 4.3, Transportation (see Impacts TR-1 and TR-2), and would not substantially disrupt bicycle access to recreational facilities in the area.

During construction, existing access to the Bay Trail within the vicinity of the WPCP would be disrupted, including temporary closure of the trail along the existing berm adjacent to the oxidation ponds. Detour routes would be designated with signage along the disrupted and closed portions of the Bay Trail. The detour would be temporary in nature and only occur during construction activities. It is possible that some recreationists may avoid recreational facilities located near project
construction sites, increasing the use of other local or regional recreation facilities (including trails and bicycle routes) in the WPCP vicinity. However, because there are many other trails and other recreational resources that are available throughout the area, the increase in use of other local or regional recreation resources that may be attributable to WPCP improvements would not substantially deteriorate or degrade existing recreational resources. For these reasons, impacts on recreational resources and potential deterioration of these resources would be less than significant.

Impacts resulting from the construction associated with the relocation of the Bay Trail Access are described in Sections 4.3 to 4.16.

4.2.3.5 Water Purification Facilities Impacts and Mitigation Measures

Impact WPF-LU-1: The WPF would be consistent with local plans and policies, a less-than-significant impact.

The following factors affect the application of the Cities of Sunnyvale, San Jose, Campbell, Cupertino, Saratoga, and/or Santa Clara general plans to the WPF:

- **Local Agency Project Approval.** No local agency approvals would be needed for the approvals for the WPF that are supported by this PEIR (see Chapter 3, Section 3.6.1). Individual infrastructure components could, in select cases, require encroachment permits from local agencies. Separate, project-level CEQA review of the WPF components will provide more detailed and up-to-date information on the approvals required for each project.

- **Building and Zoning Ordinances.** Building and zoning ordinances represent the most specific expressions of general plan goals, objectives, and policies. State law and judicial interpretation of state law mutually exempts public utilities and special-purpose local agencies (such as water districts) from complying with local building and zoning ordinances when locating or constructing facilities for the production, generation, storage, treatment, or transmission of water. The District is therefore exempt from complying with the building and zoning ordinances of cities and counties for projects like the WPF.

- **Local Government Notification and Consistency Determination Requirements.** California Government Code Section 65402(c) requires that the District inform cities and counties of its plans to construct projects. The local governments have 40 days to determine project consistency with their general plans; these consistency determinations are advisory to the District rather than binding. Approval of the WPF would not trigger the requirements of Section 65402(b), but implementation of the individual WPF infrastructure components would. The District would notify local governments of WPF facilities to be constructed, repaired, upgraded, or replaced within the city or county as part of any project-level CEQA process. Prior to project implementation, the District would notify local governments pursuant to California Government Code Section 65402(c).

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9 California Government Code Section 53090 et seq.
The intent of the general plans prepared by these communities is to preserve and improve the quality of life for its citizens and to consider growth in a manner that appropriately reflects the community’s values; an adequate, reliable water supply is a chief public service needed to accomplish these goals. The discussion below addresses the consistency of the individual WPF infrastructure components with these general plans. Regarding the potential impacts on the physical environment from implementation of these facilities, refer to Sections 4.3 through 4.16.

**WPF at the WPCP**

The new facilities at the WPCP associated with the WPF would continue to support wastewater treatment activities, and therefore, this infrastructure would be consistent with the General Plan land use designations and the P-F Public Facility zoning district, as described above for the Master Plan. The conclusions presented under Impact LU-1 also apply to WPF at the WPCP. Development of WPF components within BCDC jurisdiction would require a BCDC permit in conjunction with a determination by BCDC that these WPF components were consistent with the Bay Plan. Like the Master Plan, WPF at the WPCP would be consistent with BCDC’s Bay Plan policies related to public access. As described under Impact LU-1, construction of the Administration Building may be considered inconsistent with the Sunnyvale Landfill Postclosure Maintenance and the SCCDEH may require that the City update the plan; updating the plan would eliminate the potential plan inconsistency and ensure that the plan is consistent with CCR Title 27 requirements regarding postclosure use of landfill sites.

**Pipelines**

Although the alignments for the proposed pipelines have not been identified to date, they are assumed to be constructed within existing public streets. Pipelines are common and a typical part of the urban infrastructure. The District likely would be required to obtain encroachment permits from cities along the pipeline alignments, which would address issues such as pavement moratoriums and other applicable city policies. Once constructed, the pipelines would be buried underground and all disturbed/graded areas would be returned to pre-construction conditions. For these reasons, the pipelines would not be anticipated to conflict with any applicable local plans or policies, and impacts would be less than significant.

**Injection Wells**

Injection wells would require concrete pads roughly 400 square feet and spaced at least 1,500 feet apart. For purposes of analysis, it is assumed that the facility would occupy a property of between 5,000 and 10,000 square feet. The wells would be consistent with the general plan policies related to the provision of adequate water supplies. Because the wells could occur on a variety of land use parcels, as indicated in Table 4.2-1 above, subsequent project-level CEQA environmental review should evaluate the specific well location’s consistency with general plan land use designations which, in any case, would be advisory.10

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10 California Government Code Section 65402(c).
Recharge Basins

The recharge basins are currently being used and the uses would not change with the WPF and therefore would be consistent with the General Plan designation and zoning for these facilities.

Impact WPF LU-2: The WPF would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated, a less-than-significant impact.

Recreational resources within the WPF groundwater replenishment area includes trail extensions from the Bay Trail, other regional trails, regional and local parks, open space areas, and outdoor recreation areas.

The impacts of construction and operation of the WPF at the WPCP would be similar to those described for the Master Plan in Impact LU-2. Construction and operation of the proposed WPF groundwater replenishment facilities may affect recreation resources in proximity to those facilities. Injection wells could be sited in parks and schools. It is possible that some recreationists may avoid recreational facilities located near project construction sites due to noise and temporary limitations on access during construction, or noise-related impacts of injection well operation, resulting in increased use of other local or regional recreation facilities (including trails and bicycle routes) in the vicinity. Refer to Section 4.4, Noise and Vibration, regarding mitigation measures that would reduce noise-related impacts of injection well construction and operation. Given the size of the proposed facilities, the fact that operational noise from these types of facilities can be mitigated to less-than-significant levels, and the many trails and other recreational resources that are available throughout the WPF area, the increase in use of other local or regional recreation resources that may be attributable to construction or operation of the groundwater replenishment facilities would not be expected to substantially deteriorate or degrade existing recreational resources. For these reasons, potential deterioration of these resources would be less than significant.

At the WPCP, as well as south of the WPCP, the WPF would not include any recreation facilities, and there would be no need to construct new or expand existing recreational facilities.

4.2.4 References


City of Saratoga, Saratoga California Zoning Map, Revision Date: May 21, 2010b.


City of Sunnyvale, 2014. City of Sunnyvale Agenda Item 14-0282, Report to Council: Recreational Hunting and Safe Access to Open Space (Study Issue), Agenda Date: August 26, 2014.


Korve Engineering. 2006. *City of Sunnyvale Bicycle Plan*.


4.3 Transportation

This section describes and evaluates issues related to transportation in the context of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan and Water Purification Facilities (WPF). Discussed are the physical and regulatory setting, the baseline for determining environmental impacts, the criteria used for determining the significance of environmental impacts, and potential impacts and mitigation measures associated with implementation of the Master Plan or WPF.

4.3.1 Setting

The existing transportation-related context for the Master Plan area and the Water Purification Facilities area is described below, beginning with a description of the street network that serves these areas. Existing transit service, bicycle and pedestrian facilities in the vicinity are also described. Intersection and freeway levels of service are then defined, and current conditions for roadways and intersections in the vicinity are summarized.

4.3.1.1 Existing Roadway Network

Master Plan

The Master Plan area is generally bounded by the Sunnyvale Materials Recovery and Transfer Station (SMaRT Station®) to the east; the closed Sunnyvale Landfill surrounds the main plant on the landward side (west, south, and east). The Sunnyvale West Channel forms the main plant’s western boundary, and the Ponds 1 and 2 and the Don Edwards San Francisco Bay National Wildlife Refuge lands are located to the north. State Route 237 (SR 237) provides regional access to the site. Borregas Avenue, Caribbean Drive, and Carl Road provide local access to the WPCP site. Figure 3-1 in Chapter 3 shows the roadways within and adjacent to the Master Plan area.

Regional Roadways

SR 237 is an east-west freeway extending between the City of Mountain View and the City of Milpitas, with an interchange at Zanker Road. This freeway includes two mixed-flow lanes and a high occupancy vehicle (HOV) lane in each direction. The HOV lanes are reserved for carpools, buses, and motorcycles during peak travel periods and are available for all vehicle types during non-peak travel periods. According to the most recent data published by Caltrans, the average daily traffic volume on SR 237 in the vicinity of the Master Plan area is approximately 89,000 to 125,000 vehicles, with up to 11,700 vehicles during the peak traffic hour (Caltrans, 2015). Traffic volumes are generally higher in the westbound direction during the morning commute period and in the eastbound direction during the evening commute period.

Local Roadways

Caribbean Drive is a divided road with six travel lanes, three in each direction, that extends from SR 237 (as a continuation of Lawrence Expressway) northwest and then west to a point on a
curve between Borregas Avenue and 1st Avenue, where it turns into Mathilda Avenue. According to the most recent data published by the City of Sunnyvale, the average weekday daily traffic volume on Caribbean Drive in the vicinity of the Master Plan area is approximately 13,248 vehicles (City of Sunnyvale, 2015). **Borregas Avenue** is a two-lane roadway with paved shoulders that extends from Carl Road near the WPCP south to its terminus at East Maude Avenue. **Carl Road** is a two-lane roadway with paved shoulders used to access the main plant site and the adjacent SMaRT Station®. Carl Road is used by WPCP employees and visitors, waste haulers delivering waste from the City of Sunnyvale to the SMaRT Station®, and the public, who use a parking lot at the western end of Carl Road to access nearby trails.

**Water Purification Facilities**

The WPF would be located at the WPCP and at locations south of the WPCP (i.e., groundwater replenishment facilities areas), as shown on Figure 3-12. The existing roadway network for the WPCP is described above. The roadway network associated with the proposed groundwater replenishment facilities areas is described below.

**Regional Roadways**

The regional roadways in the vicinity of the groundwater replenishment facilities areas include U.S. 101, SR 237, Interstate 880 (I-880), I-280, SR 85, & SR 17. Pipeline alignments between the WPCP, the injection well siting area and the recharge basins have not been determined, but could be located in the cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara. Injection wells could be sited in an area roughly encompassed by SR 85, I-280 and SR 17. Existing recharge basins that could be used for groundwater replenishment are within the City of Campbell, near the intersection of SR 17 and SR 85.

U.S. 101 is a north-south freeway through Santa Clara County. The freeway includes four travel lanes per direction including HOV lanes. Northbound U.S. 101 is generally the peak morning commute direction, and southbound is the peak evening commute direction.

I-880 is a north-south freeway extending from the City of San José at the I-280/I-880/SR 17 interchange to the City of Oakland. This facility includes three or four mixed-flow lanes and an HOV lane per direction. Northbound I-880 is the peak commute direction during the morning, and southbound is the peak commute direction during the evening.

I-280 is designated as a “north-south freeway”, although it runs primarily east-west in the vicinity of the groundwater replenishment facilities areas. It starts from its interchange with U.S. 101 in the City of San José and runs first west, then north to San Francisco. East of the U.S. 101 interchange, I-280 is designated as I-680. The freeway includes four to five travel lanes per direction including HOV lanes east and north of the I-280/I-880/SR 17 interchange. The peak commute directions on I-280 are north/west during the morning and south/east during the evening.

SR 85 is also considered a “north-south” freeway that extends in a west to east direction through the City of San José from the SR 85/U.S. 101 interchange in the City of Mountain View to the
SR 85/U.S. 101 interchange in south San José. This facility includes three travel lanes per direction including HOV lanes during peak periods. Northwest bound SR 85 is the commute direction during the morning, and southeast bound SR 85 is the commute direction during the evening.

SR 17 is a north-south freeway extending from the I-280/I-880/SR 17 interchange in the City of San José to the City of Santa Cruz. The facility includes two to three mixed-flow lanes per direction. Northbound is the peak direction during the morning, and southbound is the peak direction during the evening.

**Local Roadways**

If a new pipeline is required, construction would likely occur within existing public streets. No alignments for new pipelines have been identified to date. No specific sites for the injection wells will be identified until engineering feasibility studies are completed.

Roadways in the vicinity of the existing recharge basins include San Tomas Expressway, Winchester Boulevard, Hacienda Avenue, Waldo Road, Campbell Technology Parkway, and East McGlincy Lane. **San Tomas Expressway** is a north-south, six-lane divided roadway extending from U.S. 101 south to SR 17. This facility is designated Montague Expressway north of U.S. 101. San Tomas Expressway includes HOV lanes during peak travel periods. **Winchester Boulevard** is a north-south, four-lane road that extends from Homestead Road in Santa Clara, south to its terminus at Bruce Avenue in Los Gatos. **Hacienda Avenue** is a two-lane roadway in the City of Campbell that extends from Dell Avenue west to its terminus near SR 85. **Waldo Road** is a two-lane roadway in the City of Campbell that extends from East McGlincy Lane southwest to Griffin Lane where it turns into Cristich Lane. **East McGlincy Lane** is a two-lane roadway in the City of Campbell that extends from Cristich Lane northeast to its terminus at Union Avenue.

**4.3.1.2 Existing Transit Network**

The Santa Clara Valley Transportation Authority (VTA) is an independent special district responsible for bus, light rail, paratransit operations, congestion management, highway improvement projects, and countywide transportation planning in Santa Clara County. The VTA is both a transit provider and a multimodal transportation planning organization involved with transit, highways, roadways, bikeways, and pedestrian facilities.

**Master Plan**

Public transportation available in the Master Plan vicinity is provided by VTA (bus service and light rail), which serves Santa Clara County. However, this service does not operate on roads that directly access the Master Plan site. The nearest stops are both within 0.5 mile; on Caribbean Drive at Crossman Avenue and on Java Drive at Borregas Avenue (VTA, 2014).
4. Environmental Setting, Impacts, and Mitigation Measures

4.3 Transportation

**Water Purification Facilities**

Existing transit lines in the groundwater replenishment facilities areas include Caltrain, Altamont Commuter Express (ACE), Capitol Corridor, and VTA bus and light rail. The VTA currently operates three light rail routes, 52 local bus routes, six limited stop routes, nine shuttle routes, and 12 express routes in the county. Most of the routes serve some portion of the City of San José. Most bus routes are typically located along major arterial corridors and follow relatively straight, evenly spaced routes from early morning into the late evening (VTA, 2015).

**4.3.1.3 Existing Bicycle and Pedestrian Network**

Bikeway planning and design in California typically relies on guidelines and design standards established by Caltrans in the Highway Design Manual (HDM) Chapter 1000: Bicycle Transportation Design.¹ Caltrans provides for three distinct types of bikeway facilities: Class I (bicycle paths separated from roads), Class II (striped bicycle lanes within the paved areas of roadways), and Class III (signed bike routes that allow cyclists to share streets with vehicles).

**Master Plan**

**Bicycle Facilities**

Within the WPCP service area, there are several Class III routes available for bicycle commuters and recreationists, as well as more general bicycle travel. Within the vicinity of the Master Plan area, there are Class II bike lanes along Caribbean Drive.

**Pedestrian Facilities**

Pedestrian facilities generally consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The Master Plan area currently has very limited pedestrian access, and no sidewalks are provided within the main plant site. Crosswalks are provided at the intersection of Caribbean Drive and Borregas Avenue.

The Bay Trail is a multi-purpose recreational trail that, when complete, will encircle San Francisco Bay and San Pablo Bay with a continuous 500-mile network of bicycling and hiking trails. The Bay Trail will connect the shoreline of all nine Bay Area counties in the region. The Bay Trail provides opportunities for walking, jogging, and bicycling. Within the Master Plan area, there is an existing entrance to the Bay Trail at the west end of Carl Road. Segments of the Bay Trail border the WPCP to the west and north and surround Ponds 1 and 2. Pedestrian trails have also been maintained by the City of Sunnyvale in the open space areas of the closed landfill property adjacent to the WPCP.

¹ California Department of Transportation (Caltrans), Highway Design Manual – Chapter 1000 Bicycle Transportation Design, revised July 1, 2015.
Water Purification Facilities

Bicycle Facilities
Within the groundwater replenishment facilities areas, bicycle use areas are designated on various roadways, including a Class II route on San Tomas Expressway in the vicinity of the existing recharge basins.

Pedestrian Facilities
In the groundwater replenishment facilities areas, the pedestrian facilities vary substantially by area, but can include sidewalks, multi-use paths/trails, and both grade-separated and at-grade crossings. Neighborhood and community shopping centers located on major and minor arterial roadways surrounding neighborhoods can be accessed via residential collector streets with sidewalks. Pedestrian-operated signals at higher volume intersections aid pedestrians in crossing the street.

In the groundwater replenishment facilities areas, there are three separate trails that extend from the Bay Trail to the south: one portion extends to San Tomas Expressway, the other follows the Lower Guadalupe River Trail to approximately SR 87 and the last portion extends along Coyote Creek to Montague Expressway. There are other recreational trails located adjacent to waterways in the vicinity of the groundwater replenishment facilities areas including the Guadalupe River Trail, San Tomas-Aquino Trail, Los Gatos Creek Trail, and the Coyote Creek Trail.

4.3.1.4 Existing Traffic Conditions

Intersection Level of Service
The operation of a local roadway network is commonly measured and described using a grading system called Level of Service (LOS). The LOS grading system qualitatively characterizes traffic conditions associated with varying levels of vehicle traffic, ranging from LOS A (indicating free-flow traffic conditions with little or no delay experienced by motorists) to LOS F (indicating congested conditions where traffic flows exceed design capacity and result in long delays). This LOS grading system applies to both roadway segments and intersections. Table 4.3-1 and Table 4.3-2 show LOS designation for signalized intersections and freeways.

The VTA oversees the Santa Clara County Congestion Management Program (CMP), which includes a mandatory traffic LOS standard element. To comply with the CMP standard, the cities within Santa Clara County must demonstrate that all CMP roadways (excluding freeways) within their jurisdictions are operating at or above the CMP traffic level of service standard of LOS E.

Master Plan
The VTA evaluates expressways and arterials based on the traffic operating condition at the selected intersections on these CMP roadways. According to the VTA’s 2012 Annual Monitoring and Conformance Report, the intersections along the CMP roadways in the Master Plan area vicinity all operate at LOS D or better during the peak hours (VTA, 2012).
4. Environmental Setting, Impacts, and Mitigation Measures

4.3 Transportation

### TABLE 4.3-1

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description</th>
<th>Average Control Delay per Vehicle (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Operations with very low delay occurring with favorable progression and/or short cycle lengths.</td>
<td>≤ 10.0</td>
</tr>
<tr>
<td>B+</td>
<td>Operations with low delay occurring with good progression and/or short cycle lengths.</td>
<td>10.1 to 12.0</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>12.1 to 18.0</td>
</tr>
<tr>
<td>B-</td>
<td></td>
<td>18.1 to 20.0</td>
</tr>
<tr>
<td>C+</td>
<td>Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.</td>
<td>20.1 to 23.0</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>23.1 to 32.0</td>
</tr>
<tr>
<td>C-</td>
<td></td>
<td>32.1 to 35.0</td>
</tr>
<tr>
<td>D+</td>
<td>Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.</td>
<td>35.1 to 39.0</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>39.1 to 51.0</td>
</tr>
<tr>
<td>D-</td>
<td></td>
<td>51.1 to 55.0</td>
</tr>
<tr>
<td>E+</td>
<td>Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.</td>
<td>55.1 to 60.0</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>60.1 to 75.0</td>
</tr>
<tr>
<td>E-</td>
<td></td>
<td>75.1 to 80.0</td>
</tr>
<tr>
<td>F</td>
<td>Operations considered unacceptable to most drivers, often caused when arrival flow rates exceed the capacity, and also poor progression, long cycle lengths, and high V/C ratios, which contribute substantially to long delays.</td>
<td>≥ 80.1</td>
</tr>
</tbody>
</table>


### TABLE 4.3-2

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Maximum Density Range&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≤ 11</td>
</tr>
<tr>
<td>B</td>
<td>&gt; 11-18</td>
</tr>
<tr>
<td>C</td>
<td>&gt; 18-26</td>
</tr>
<tr>
<td>D</td>
<td>&gt; 26-35</td>
</tr>
<tr>
<td>E</td>
<td>&gt; 35-45</td>
</tr>
<tr>
<td>F</td>
<td>&gt; 45</td>
</tr>
</tbody>
</table>

<sup>a</sup> Maximum density based on passenger cars per hour per travel lane (pc/h/lane).


The VTA analyzes and monitors the traffic operating condition of freeways and CMP roadways in the Santa Clara County. According to the 2012 Annual Monitoring and Conformance Report the following freeway travel directions in the Master Plan vicinity operate at LOS F during the peak hours (VTA, 2012):

- **U.S. 101**: northbound in both AM and PM peak hours.
- **SR 237**: both directions in both AM and PM peak hours.
4. Environmental Setting, Impacts, and Mitigation Measures

4.3 Transportation

- I-280: westbound in the AM peak hour and eastbound in the PM peak hour.
- SR 85: northbound in the AM peak hour and southbound in the PM peak hour.

The AM and PM peak hours typically occur within the two-hour periods from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., respectively.

**Water Purification Facilities**

As part of the VTA’s 2012 Annual Monitoring and Conformance Report, VTA conducted intersection level of service analyses for all CMP intersections, with the exception of City of Campbell and City of Cupertino which performed their own LOS analysis (VTA, 2012). Three of the 252 intersections operated at LOS F during the PM peak hour:

- Montague Expressway and McCarthy Blvd/O’Toole Avenue,
- Page Mill/Oregon Expressway and Foothill Expressway, and
- De La Cruz and Central Expressway

According to the 2012 Annual Monitoring and Conformance Report there were 85 AM freeway segments (85 directional miles) and 74 PM freeway segments (70 directional miles) that operated at LOS F (VTA, 2012).

**4.3.2 Regulatory Setting**

**4.3.2.1 Federal Regulations**

No specific federal regulations related to traffic and transportation are applicable.

**4.3.2.2 State Regulations**

*California Department of Transportation (Caltrans)*

The California Department of Transportation (Caltrans) manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulation of the use of state roadways. Caltrans has jurisdiction over state highway facilities, including freeway segments, signalized intersections on state highways, and on- and off-ramp intersections with local roadways. Improvements to freeways and state highways must meet Caltrans standards. Caltrans recommends a target LOS between LOS C and LOS D for their facilities. Within proximity of the Master Plan area, there is one facility that falls under Caltrans’ jurisdiction: SR 237. In the vicinity of the groundwater replenishment facilities areas the following fall with Caltrans’ jurisdiction: SR 237, U.S. 101, I-880, I-280, SR 85, and SR 17.
4.3.2.3 Regional Plans

Santa Clara Valley Transportation Authority (VTA)

The VTA serves as the Congestion Management Agency (CMA) of Santa Clara County. As the County’s CMA, VTA is responsible for managing the county’s blueprint to reduce traffic congestion and improve air quality. VTA is authorized to set state and federal funding priorities for transportation improvements affecting the Santa Clara County CMP transportation system. VTA forwards the County’s prioritized list of projects to the Metropolitan Transportation Commission (Metropolitan Planning Organization [MPO] for the San Francisco Bay Area) for incorporation into the regional list to receive state and federal funding.

Santa Clara County Congestion Management Program

VTA oversees the Santa Clara County CMP. The relevant State legislation requires that all urbanized counties in California prepare a CMP in order to obtain each county’s share of gas tax revenues. The CMP legislation requires that each CMP contain the following five mandatory elements: 1) a system definition and traffic level of service standard element; 2) a transit service and standards element; 3) a trip reduction and transportation demand management element; 4) a land use impact analysis program element; and 5) a capital improvement element. The Santa Clara County CMP includes the five mandated elements and three additional elements, including: a county-wide transportation model and data base element, an annual monitoring and conformance element, and a deficiency plan element. The VTA most recently updated the CMP in 2013 (VTA, 2013).

The CMP system includes all freeways, state highways, and major arterials in Santa Clara County. The program sets level of service standards for all CMP roadway segments and intersections. The LOS standard for all freeways and state highways is LOS E, and any facility operating at LOS F is deemed deficient. The LOS standard for CMP intersections is LOS D and intersections operating at LOS E or F are operating at unacceptable conditions. The CMP also contains an element promoting the use of alternative transportation modes and ways to reduce future travel demand. Improving the county’s jobs/housing balance and implementing travel demand management strategies are specifically mentioned as ways of attaining the objectives of this element of the CMP. VTA requires local jurisdictions to analyze impacts of new developments or land use policy changes on CMP facilities.

4.3.2.4 Local Plans and Policies

Master Plan

City of Sunnyvale General Plan

The Sunnyvale General Plan establishes the policy framework that serves as the City’s basis for decision-making, and guides the community’s near-term and long-range development. The goals and policies of the General Plan reflect the City’s philosophy on development and provide
guidance for making decisions on related issues. Transportation policies that are relevant to the proposed Master Plan include:

- **Policy LT-5.1**: Achieve an operating level of service (LOS) of “D” or better on the City-wide roadways and intersections, as defined by the functional classification of the street system.

- **Policy LT-5.8**: Provide a safe and comfortable system of pedestrian and bicycle pathways.

### City of Sunnyvale Temporary Traffic Control Guidelines

The City’s Temporary Traffic Control (TTC) guidelines are to assist developers and contractors in designing a TTC Plan when any and all work is done within the City of Sunnyvale’s right-of-way. The contractor is responsible for inspecting all traffic detour routes to ensure adequate horizontal and vertical clearances for construction vehicles are maintained from obstructions (e.g., poles and overhanging tree limbs) and report to the City prior to commencement of work. The contractor is also responsible for implementing and maintaining TTC at all times when needed and removing TTC promptly when not needed.

### Water Purification Facilities

#### Santa Clara County General Plan

The Transportation Chapter of the Santa Clara County General Plan, 1995-2010 (Santa Clara County, 1994) provides guiding principles for maintaining and managing the County’s transportation network. Policies and implementation strategies pertaining to transportation that are relevant to the WPF include the following:

- **Policy C-TR-5**: The transportation plans and the land use plans, specific plan, and redevelopment plans of local jurisdictions should be consistent and mutually-reinforcing in order to enhance transportation infrastructure investment.

- **Policy C-TR-12**: It is the goal of this plan to achieve a level of service (LOS) no lower than LOS D at peak travel periods on city streets, county roads, expressways, and state highways. However, in certain instances, a lower level of service may be acceptable when LOS D cannot practically be achieved.

- **Implementation Strategy C-TR(i) 6**: Development proposals which would cause existing levels of service for roadways segments and intersections in the vicinity of the proposed project to fall below level of service D at peak travel periods; or would create congestion at peak periods worse than level of service D on nearby roadway segments and intersections may be approved if either of the following mitigations are included in the project:

  1. The developer implements ‘reasonable’ mitigation measures to offset increases in traffic congestion created by the project. Such mitigation measures could include contributing to transit improvements, contribution to TSM [transportation system management] improvements, establishing employer-based TDM [transportation demand management] measures or other measures acknowledged by the Congestion Management Agency to offset the level of service impacts of the proposed project.
4.3.3 Impacts and Mitigation Measures

4.3.3.1 Thresholds of Significance

For the purposes of this PEIR, a transportation impact is considered significant if implementation of the proposed project would result in any of the following:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit, non-motorized travel, and relevant components of the circulation system (including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit);
- Conflict with an applicable CMP, including, but not limited to, level of service (LOS) standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in locations that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

In addition to the criteria above, the following standards were used to identify significant impacts of the proposed project:

Santa Clara Valley Transportation Authority Intersection Standards of Significance

Significant impacts at CMP intersections occur when project traffic causes one of the following:

- Operations degrade from an acceptable level (LOS E or better) under Existing Conditions to an unacceptable level (LOS F) under Existing plus Project Conditions.
- LOS F operations are exacerbated by increasing the critical delay by more than four seconds and increasing the volume-to-capacity (V/C) ratio by 0.01 or more.
- The V/C ratio increases by 0.01 or more at an intersection with LOS F operations when the change in critical delay is negative (i.e., decreases). This can occur if the critical movements change.

Freeway Standards of Significance

VTA’s CMP guidelines require that freeway segments to which a proposed development is projected to add trips equal to or greater than one percent of the freeway segment’s capacity must
be evaluated. As such, significant impacts to freeway segments occur when the addition of project traffic causes one of the following:

- A segment to drop below its acceptable CMP operating standard (LOS E).
- Unacceptable operations (LOS F) of a segment are exacerbated by adding traffic equal to more than one percent of a segment’s capacity.

4.3.3.2 Approach to Analysis

This section addresses transportation issues associated with construction and operation of the Master Plan and WPF with regard to potential effects on key intersections; freeway segments; pedestrian, bicycle, and transit facilities; and emergency access and traffic safety. Measures necessary to mitigate significant impacts are identified.

Detailed information on construction of Master Plan improvements is not currently available. However, the general type of construction activities and equipment to be used for Master Plan improvements, described in Section 3.4.8 in Chapter 3, Project Description, would be similar to those identified for the Primary Treatment Facility Project to be constructed at the main plant beginning in 2016. When project-level CEQA review of Master Plan improvements is initiated, the City will review the analysis in this section in light of available project-level construction information and update analyses accordingly.

Detailed vehicle trips were calculated for the three construction phases of the Primary Treatment Facility Project, and were used to estimate the relative magnitude of daily vehicle trips for similar activities proposed at the WPCP under the Master Plan and the WPF. Phase 1 of the Primary Treatment Facility Project would involve earthwork activities such as site preparation, excavation, import of infill material, and off-hauling of surcharge; Phase 2 of the Primary Treatment Facility Project would include laying foundations, concrete work, backfilling and paving; and Phase 3 would involve activities associated with demolition and site restoration. Vehicle trip estimates were prepared for each of these phases based on detailed and project- and phase-specific construction-related assumptions, such as the number of on-road vehicle trips (for construction workers and haul trucks) and daily equipment usage rates in terms of hours per day and total days. With input from Carollo Engineers, the Master Plan improvements and WPF were associated with comparable phases (in terms of construction intensity) of Primary Treatment Facility Project construction. The maximum number of truck trips per day associated with the Primary Treatment Facility Project is estimated at 167 trips per day. Comparing the vehicle trips associated with the construction phases of the Primary Treatment Facility to each Master Plan and WPF stage, as well as the timing when multiple stages would be constructed simultaneously, a maximum number of offsite truck trips under the Master Plan and WPF construction was estimated.

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2 The Sunnyvale Water Pollution Control Plant Primary Treatment Facility Project Initial Study/Mitigated Negative Declaration (SCH Number 2014112037) is available at City of Sunnyvale Department of Public Works, 456 West Olive Avenue, Sunnyvale CA 94086). Approved in May 2015.
The following CEQA criteria topics are not discussed further in this section, because these issues are not applicable:

**Threshold of Significance:** Would the project conflict with an applicable CMP, including, but not limited to, level of service (LOS) standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

Legislation that created the CMP excludes certain types of traffic from a determination of conformance with CMP traffic LOS standards. Construction traffic is one of these exclusions; for this reason, traffic generated by construction from the proposed Master Plan or WPF would not conflict with the CMP and does not require LOS analysis.

With implementation of the Master Plan, the work force at the WPCP would remain at about 34 operations and maintenance staff (refer to Section 3.4.9, Operating Characteristics, for additional details). During operations, the effects of the WPF at the WPCP on consistency with applicable CMP or other standards would be the same as described above, as the work force for implementation of the WPF improvements at the WPCP would not substantially differ from existing conditions (i.e., three to four additional workers). The new pipelines would be buried underground and, once installed, would not require additional staff for maintenance of the pipelines. With implementation of the WPF, the groundwater recharge basins would continue to be in operation and used for groundwater recharge.

Caribbean Drive is the CMP system network roadway nearest to the Master Plan. The City proposes to close Carl Road to public access west of Borregas Avenue and relocate access to the Bay Trail via an enhanced access point from Caribbean Drive at the Sunnyvale West Channel. As described above, Caribbean Drive is a divided road with three travel lanes in each direction. To accommodate the relocated Bay Trail access, one lane of Caribbean Drive would be closed in the westbound direction, both to the east and west of the new Bay Trail access location for approximately 950 feet and converted to parking (refer to Figure 3-10). According to the VTA’s 2012 Annual Monitoring and Conformance Report, the CMP roadways in the Master Plan area vicinity, including Caribbean Drive, all operate at LOS D or better during the peak hours. The Master Plan would not generate new (increased) traffic once operational, so the traffic volume on Caribbean Drive would not change as a result of the Master Plan. As stated above, the average weekday daily traffic volume on Caribbean Drive in the vicinity of the Master Plan area is approximately 13,248 vehicles. As a general rule-of-thumb for transportation planning purposes, the carrying capacity of six-lane divided arterials like Caribbean Drive ranges from about 32,000 to 50,000 vehicles per day; the carrying capacity for four-lane divided arterials ranges from 20,000 to 33,000 vehicles per day. Given that Caribbean Drive would have five lanes in the road segment affected by the relocated Bay Trail access, and would continue to have six lanes on other parts of the road, the future carrying capacity would continue to accommodate traffic at no worse than the LOS D standard for CMP roadways. In addition, the existing daily volume-to-capacity ratio (i.e., how congested [near capacity] is a roadway) is no higher than 0.66 (13,248/20,000), and most would likely lower (as the 20,000 vehicles per day capacity is the low end of a four-lane divided road), and the future constrained road segment would have five lanes. Therefore, the proposed project would not have an impact on CMP-designated roadways, and this impact category is not examined further.
Threshold of Significance: Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in locations that results in substantial safety risks?

Moffett Federal Airfield is approximately 1.75 miles west of the main plant. The Norman Y. Mineta San José International Airport is approximately five miles southeast of the main plant. The next nearest airport is the Palo Alto Airport, six miles northwest of the main plant. These distances are outside of the limits of established height restrictions for development in the vicinity of airports, described in Federal Aviation Administration regulations (CFR 14 Part 77 §77.17). New structures would be constructed within the boundaries of the existing Master Plan area.

The pipelines associated with the groundwater replenishment facilities would be placed below-grade once complete. The proposed injection wells would not include erecting structures that would exceed the established height restrictions for development in the vicinity of airports. Proposed changes in operating characteristics of the recharge basins do not involve construction of new facilities.

Due to the nature of the Master Plan and the WPF improvements, there would be no impacts related to air traffic patterns, as the Master Plan and the WPF would not introduce new air traffic or interfere with existing air traffic. Therefore, the Master Plan and WPF would have no impact on air traffic patterns, nor would they result in any substantial air safety risks. This impact category is therefore not examined further.

4.3.3.3 Impact Summary

Table 4.3-3 lists the project’s transportation impacts and significance determinations.

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<thead>
<tr>
<th>Sunnyvale WPCP</th>
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<tr>
<th>TR-1: Conflict With Measures of Effectiveness for the Circulation System</th>
<th>TR-2: Hazards Due to Design Feature or Incompatible Uses</th>
<th>TR-3: Emergency Access</th>
<th>TR-4: Conflict With Public Transit, Bicycle, or Pedestrian Facilities</th>
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<td>Water Purification Facilities</td>
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LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation
4.3.3.4 Master Plan Impacts and Mitigation Measures

Impact TR-1: The activities associated with the project would temporarily reduce roadway capacity and increase traffic delays on area roadways, which could conflict with applicable measures of effectiveness for the performance of the circulation system, a less-than-significant impact with mitigation.

Construction

Construction of proposed Master Plan improvements would involve several general types of activities: demolition or rehabilitation of some existing facilities and site clearing; earthwork (grading, excavation, sheet pile driving, and groundwater dewatering); and facility construction. Construction would occur throughout the Master Planning Period (20-plus years); within the construction period for each improvement, there would be periods of more intensive activity and attendant peaks in construction traffic, typically occurring during earthwork, followed by longer periods of reduced activity. Haul trucks would primarily use a combination of highways (e.g., SR 237) and the local streets identified above, accessing the site via a temporary construction access gate off Carl Road, and would be travelling to and from other local points and/or regional locations. Trucks would haul materials away from, and to, the site.

The impact of construction truck traffic would be a temporary lessening of the capacities of local streets due to the slower movement and larger turning radii of trucks, which could affect both traffic and transit operations; however, this level of truck activity would not be sufficient to result in significant impacts to intersection operations or to transit service. The most intensive truck travel under the improvements would occur when multiple phases occur simultaneously. Construction activities are further described in Chapter 3, Section 3.4.8.

With truck trips spread out over an 11-hour work day (i.e., between 7:00 a.m. and 6:00 p.m.), there would be an estimated 564 one-way trips per day, over approximately 5 months. The number of truck trips that would be needed to support the construction of the diurnal equalization and emergency storage facilities was not estimated due to lack of information.

The estimated maximum size of the construction workforce traveling to and from each work site on an average day would not be expected to exceed a 28 person work crew, generating about 84 one-way trips per day (with workers assumed to commute to/from the work site during the peak hours).

The truck trips that would coincide with peak-hour traffic could impede traffic flow on local roadways (including Carl Road east of Borregas and Caribbean Drive). With implementation of Mitigation Measures TR-1a, Truck Route Plan, and TR-1b, Implement a Temporary Traffic Control Plan, this impact would be reduced to a less-than-significant level.

Operation

The proposed improvements to the WPCP would not materially increase the size of the workforce of 34 operations and maintenance staff (refer to Section 3.4.9, Operating Characteristics, for...
additional details). Because the Master Plan would not create additional traffic once operational, it would not conflict with any of the established measures of effectiveness for the performance of the circulation system.

**Mitigation Measures**

**Mitigation Measure TR-1a: Truck Route Plan**

As part of pre-construction submittals, the contractor(s) shall submit a truck route plan to the City of Sunnyvale Public Works Department for review and approval to help minimize impacts to adjacent roadways.

**Mitigation Measure TR-1b: Implement a Temporary Traffic Control Plan**

The City contractor(s) shall prepare and implement a traffic control plan using the City’s Temporary Traffic Control guidelines to reduce traffic impacts on the roadways at and near the work site, as well as to reduce potential traffic safety hazards and ensure adequate access for emergency responders. The City shall coordinate development and implementation of this plan with City departments (e.g., Emergency Services, Fire, Police, Transportation), as appropriate. To the extent applicable, the traffic control plan shall conform to the Caltrans’ *California Manual on Uniform Traffic Control Devices*, Part 6 (Temporary Traffic Control; Caltrans, 2014). The traffic control plan shall include, but not be limited to, the following elements:

- Circulation and detour plans to minimize impacts on local road circulation during road and lane closures. Flaggers and/or signage shall be used to guide vehicles through and/or around the construction zone.

- Controlling and monitoring construction vehicle movement through the enforcement of standard construction specifications by onsite inspectors.

- Sufficient staging areas for trucks accessing construction zones to minimize disruption of access to adjacent public rights-of-way.

- Scheduling truck trips outside the peak morning and evening commute hours to the extent possible.

- Maintaining pedestrian and bicycle access and circulation during project construction where safe to do so. If construction activities encroach on bicycle routes or multi-use paths, advance warning signs (e.g., “Bicyclists Allowed Use of Full Lane” and/or “Share the Road”) shall be posted that indicate the presence of such users.

- Identifying detours for bicycles and pedestrians, where applicable, in all areas affected by project construction.

- Implementing roadside safety protocols. Advance “Road Work Ahead” warning and speed control signs (including those informing drivers of State legislated double fines for speed infractions in a construction zone) shall be posted to reduce speeds and provide safe traffic flow through the work zone.
4. Environmental Setting, Impacts, and Mitigation Measures
4.3 Transportation

- Coordinating construction with administrators of police and fire stations (including all fire protection agencies), and recreational facility managers. Operators shall be notified in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures, where applicable.

- Storing all equipment and materials in designated contractor staging areas on or adjacent to the worksite, such that traffic obstruction is minimized.

**Conclusion:** Less than Significant with Mitigation.

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**Impact TR-2:** The project would increase traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways due to roadway design features, incompatible uses, or project-related vehicle trips, a less-than-significant impact with mitigation.

**Construction**

Implementation of the Master Plan could cause potential temporary traffic safety hazards due to (1) conflicts where construction vehicles access a public right-of-way (Carl Road east of Borregas Avenue) from the Master Plan area or (2) increased truck traffic with associated slower speeds and wider turning radii. Traffic safety hazards could also occur where delivery and haul trucks share the roadway with other vehicles. While the use of haul trucks could affect road conditions by increasing the rate of road wear, Caribbean Drive is defined as a Major Street (City of Sunnyvale, 2011) and is designed to handle heavy trucks, like those hauling waste and recyclable materials to the adjacent SMaRT Station®. As described above, there would be an estimated 564 daily one-way construction truck trips. Implementation of **Mitigation Measure TR-1b** (Implement a Temporary Traffic Control Plan) would reduce potential impacts to traffic safety. Based on these findings, the project impacts to traffic safety hazards would be less than significant with mitigation.

**Operation**

The City proposes to close Carl Road to public access west of Borregas Avenue and relocate access to the San Francisco Bay Trail via Caribbean Drive at the Sunnyvale West Channel (see Figure 3-10 for general location). Proposed changes to Caribbean Drive include converting one lane of westbound Caribbean Drive to the east and west of the new Bay Trail access location to parking, in combination with grading, sidewalk, and landscaping improvements; the existing bike lane would be shifted (i.e., included in the designed westbound Caribbean Drive). Pavement markings and signs would direct westbound motorists through the transition from three lanes to two lanes and back to three lanes. As described above, the future carrying capacity of Caribbean Drive would continue to accommodate traffic at no worse than the LOS D standard for CMP roadways, and as a result, the Master Plan would not increase hazards due to a design feature. In addition, the Master Plan would not introduce incompatible uses to the area and the WPCP would continue to generate the same level and type of traffic as it currently does. Overall, the project would not alter roadway geometries or provide new roadway design features that would result in increased traffic safety hazards for vehicles, bicyclists, and pedestrians along nearby roadways.
Mitigation Measures

Implement Mitigation Measure TR-1b (Implement a Temporary Traffic Control Plan).

Conclusion: Less than Significant with Mitigation.

Impact TR-3: The project could result in inadequate emergency access, a less-than-significant impact with mitigation.

Construction

The changes to Caribbean Drive may require temporary lane closures during construction activities; however, use of Caribbean Drive would be maintained and implementation of Mitigation Measure TR-1b (Implement a Temporary Traffic Control Plan) would reduce potential impacts related to emergency access during project construction. Because access would be maintained to the site for both emergency and general vehicles and the Master Plan would not create any obstructions that would impede access in the event of an emergency, with implementation of Mitigation Measure TR-1, the impact of Master Plan construction on emergency access would be less than significant.

Operation

Existing access to the Master Plan site is gained via Carl Road, from Borregas Avenue. The City proposes to close Carl Road to public access west of Borregas Avenue and relocate access to the San Francisco Bay Trail via an enhanced access point from Caribbean Drive at the Sunnyvale West Channel. However, access to the main plant site would still be maintained via Borregas Avenue and Carl Road, east of Borregas Avenue. The proposed changes to Caribbean Drive would not impede emergency access, and the Master Plan does not include any design features that would restrict emergency vehicles from the main plant site with the exception of the proposed retractable flood gate at each entrance of the WPCP (which are designed to ensure continued operation of the Plant in the event of a flood emergency). The design of the facility would be reviewed and approved by the City’s traffic engineer and fire department to ensure adequate emergency access.

Mitigation Measures

Implement Mitigation Measure TR-1b (Implement a Temporary Traffic Control Plan).

Conclusion: Less than Significant with Mitigation.
Impact TR-4: The project would not conflict with adopted policies, plans, and programs supporting alternative transportation, or decrease the performance or safety of such facilities, a less-than-significant impact.

WPCP improvements would not directly or indirectly eliminate alternative transportation corridors or facilities, nor would the Master Plan include changes in adopted policies, plans, or programs that support alternative transportation. As discussed in Sections 4.3.1.2 and 4.3.1.3 above, there is no existing transit service to the Master Plan area, and there is limited bicycle and pedestrian activity in the vicinity. Additionally, there are no sidewalks within the Master Plan vicinity, and the existing bike lanes on Caribbean Drive would not be adversely affected. The City proposes to relocate access to the San Francisco Bay Trail via an enhanced access point from Caribbean Drive at the Sunnyvale West Channel. As a result, the WPCP improvements would not conflict with adopted policies, plans, and programs and therefore the impact would be less than significant.

Mitigation: None required.

4.3.3.5 WPF Impacts and Mitigation Measures

Impact WPF-TR-1: The activities associated with the project would temporarily reduce roadway capacity and increase traffic delays on area roadways, which could conflict with applicable measures of effectiveness for the performance of the circulation system, a less-than-significant impact with mitigation.

Construction

WPF Improvements at the WPCP. The impact of construction truck traffic would be a temporary lessening of the capacities of local streets due to the slower movement and larger turning radii of trucks, which could affect both traffic and transit operations; however, this level of truck activity is not expected to be sufficient to result in significant impacts to intersection operations or to transit service. The most intensive truck travel associated with WPF improvements at the WPCP would occur during the simultaneous construction of multiple WPF improvements. Construction activities are further described in Chapter 3, Section 3.5.8.

With truck trips spread out over an 11-hour work day (i.e., between 7:00 a.m. and 6:00 p.m.) there would be an estimated 318 one-way trips per day or up to 29 truck trips per hour over approximately 5 months. The number of truck trips that would be needed to support the construction of the diurnal equalization and emergency storage facilities was not estimated due to lack of information.

The estimated maximum size of the construction workforce traveling to and from each work site on an average day would not be expected to exceed a 28 person work crew, generating about 84 one-way trips per day (with workers assumed to commute to/from the work site during the peak hours).
Pipelines and Injection Wells. The WPF would also include the installation of pipelines within existing roadways, which would require lane closures during construction activities. Although alignments for new pipelines have not been identified to date, and it is therefore unknown in which streets these pipelines could be located, implementation of mitigation described below would ensure that access to the selected roadways would be maintained throughout pipeline construction. Installation of the new pipelines in two-lane roadways would result in one-way alternate traffic flow around the construction zone; installation in roadways with four or more lanes would be expected to accommodate two-way traffic flow on the travel lanes not closed during construction hours. Similarly, injection well locations are not yet known, but construction of the injection wells could require lane closure on narrower streets.

The truck trips that would coincide with peak-hour traffic could impede traffic flow on local roadways (including Carl Road and Caribbean Drive) and temporary lane closures during pipeline and injection well construction would reduce the roadway capacity and disrupt circulation along the roadway. Impeding traffic flow and reducing roadway capacity would be considered a significant impact. Implementation of Mitigation Measure WPF-TR-1, Implement a Temporary Traffic Control Plan, would reduce this impact to a less-than-significant level. This measure would maintain circulation along the proposed pipeline routes and around proposed injection well sites, enhance traffic safety, and maintain access during pipeline and well installation and related construction activities.

Operation
The pipelines, once constructed, would be buried underground and would not be expected to require additional staff for maintenance of the pipelines, since there are existing pipes that would be within the vicinity already being maintained. It is assumed that maintenance of the pipes may require one to two vehicle trips per day, at the most. With implementation of the WPF, the groundwater recharge basins would continue to be in operation and used for groundwater recharge. The injection wells would be unmanned. Three to four new employees would operate the WPF at the WPCP, generating 12 new one-way trips per day. Based on the existing traffic volumes of the roadways surrounding the WPCP (i.e., approximately 13,248 vehicles average weekday daily on Caribbean Drive), this increase would add less than one percent of the average weekday traffic and therefore, would not be expected to impede traffic flow on local roadways. Because the WPF would not create substantial additional traffic once operational, it would not conflict with any of the established measures of effectiveness for the performance of the circulation system.

Mitigation Measures

Mitigation Measure WPF-TR-1: Implement a Temporary Traffic Control Plan
The District shall require the contractor(s) to prepare and implement a traffic control plan to reduce traffic impacts on the roadways at and near the work site, as well as to reduce potential traffic safety hazards and ensure adequate access for emergency responders. The District shall coordinate development and implementation of this plan with relevant County and City departments (e.g., Emergency Services, Fire, Police, Transportation), as appropriate. To the extent applicable, the traffic control plan shall conform to the Caltrans’
California Manual on Uniform Traffic Control Devices, Part 6 (Temporary Traffic Control). The traffic control plan shall include, but not be limited to, the following elements:

- Circulation and detour plans to minimize impacts on local road circulation during road and lane closures. Flaggers and/or signage shall be used to guide vehicles through and/or around the construction zone.
- Identifying truck routes designated by Santa Clara County. Haul routes that minimize truck traffic on local roadways shall be utilized to the extent possible.
- Controlling and monitoring construction vehicle movement through the enforcement of standard construction specifications by onsite inspectors.
- Sufficient staging areas for trucks accessing construction zones to minimize disruption of access to adjacent public rights-of-way.
- Scheduling truck trips outside the peak morning and evening commute hours to the extent possible.
- Limiting the duration of road and lane closures to the extent possible.
- Maintaining pedestrian and bicycle access and circulation during project construction where safe to do so. If construction activities encroach on bicycle routes or multi-use paths, advance warning signs (e.g., “Bicyclists Allowed Use of Full Lane” and/or “Share the Road”) shall be posted that indicate the presence of such users.
- Identifying detours for bicycles and pedestrians, where applicable, in all areas affected by project construction.
- Implementing roadside safety protocols. Advance “Road Work Ahead” warning and speed control signs (including those informing drivers of State legislated double fines for speed infractions in a construction zone) shall be posted to reduce speeds and provide safe traffic flow through the work zone.
- Coordinating construction with administrators of police and fire stations (including all fire protection agencies), and recreational facility managers. Operators shall be notified in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures, where applicable.
- Storing all equipment and materials in designated contractor staging areas on or adjacent to the worksite, such that traffic obstruction is minimized.
- Repairing and restoring affected roadway rights-of-way to their original condition after construction is completed.

**Conclusion:** Less than Significant with Mitigation.
Impact WPF-TR-2: The project would increase traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways due to roadway design features, incompatible uses, or project-related vehicle trips, a less-than-significant impact with mitigation.

**Construction**

Implementation of the WPF could cause potential temporary traffic safety hazards due to (1) conflicts where construction vehicles access a public right-of-way from the WPF area or (2) increased truck traffic with associated slower speeds and wider turning radii. As described above, there would be an estimated 318 daily one-way construction truck trips. Traffic safety hazards could also occur where delivery and haul trucks share the roadway with other vehicles. Additionally, the WPF would include the installation of pipelines within existing roadways, which would require lane closures during construction activities. However, traffic flow would be maintained and implementation of Mitigation Measure WPF-TR-1 (Implement a Temporary Traffic Control Plan), would reduce potential impacts to traffic safety during construction of the project. Based on these findings, the project impacts to traffic safety hazards would be less than significant.

**Operation**

The proposed WPF as currently defined do not include any features that would alter roadway geometries or provide new roadway design features that would result in traffic safety hazards for vehicles, bicyclists, and pedestrians along nearby roadways.

**Mitigation Measures**

Implement Mitigation Measure WPF-TR-1 (Implement a Temporary Traffic Control Plan).

**Conclusion:** Less than Significant with Mitigation.

Impact WPF-TR-3: The project could result in inadequate emergency access, a less-than-significant impact with mitigation.

**Construction**

The changes to Caribbean Drive may require temporary lane closures during construction of the WPF at the WPCP. Construction of the groundwater replenishment facilities would require lane closures during pipeline construction and may require lane closures during injection well construction, depending on where the wells were located. However, implementation of Mitigation Measure WPF-TR-1 (Implement a Temporary Traffic Control Plan), described above under Impact WPF-TR-1, would reduce impacts related to traffic flow and maintain access for emergency vehicles. Because access would be maintained to the sites for emergency vehicles, and the WPF would not create any obstructions that would impede access in the event of an emergency, with implementation of Mitigation Measure WPF-TR-1 the impact of WPF construction on emergency access would be less than significant.
Operation

As described above, the pipelines associated with the groundwater replenishment facilities would be placed below grade once complete. Although no specific sites for the injection wells will be identified until engineering feasibility studies are completed, preliminary sites considered to date include open space, parks, public-use (i.e., schools), and residential parcels. Injection wells would require concrete pads roughly 400 square feet and spaced at least 1,500 feet apart. Based on the size and scale of the well sites and the proposed use, siting the injection wells within the proposed well siting area would not be expected to result in inadequate emergency access. The recharge basins already exist and will continue to be utilized for groundwater replenishment. Therefore, none of these facilities would result in inadequate emergency access.

Mitigation Measures

Implement Mitigation Measure WPF-TR-1 (Implement a Temporary Traffic Control Plan).

Conclusion: Less than Significant with Mitigation.

Impact WPF-TR-4: The project would not conflict with adopted policies, plans, and programs supporting alternative transportation, a less-than-significant impact.

The WPF improvements at the WPCP would be similar to those described for the Master Plan in Impact TR-4, above, and would not adversely affect the existing bike lanes on Caribbean Drive. The WPF improvements would not directly or indirectly eliminate alternative transportation corridors or facilities, nor would the WPF include changes in adopted policies, plans, or programs that support alternative transportation. As a result, the WPF improvements would not conflict with adopted policies, plans, and programs and therefore the impact would be less than significant.

Mitigation: None required.

4.3.4 References


VTA, 2015. Schedules By Type. Available at: http://www.vta.org/getting-around/schedules/by-type

4.4 Noise and Vibration

This section describes and evaluates issues related to noise and vibration in the context of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan and Water Purification Facilities (WPF). Discussed are the fundamentals of acoustics and environmental noise, the physical and regulatory setting, the criteria used for determining the significance of environmental impacts, and potential impacts and recommended mitigation measures associated with implementation of the Master Plan or WPF. Impacts to wildlife resulting from Master Plan or WPF noise and vibration are evaluated in Section 4.7, Biological Resources.

4.4.1 Fundamentals of Acoustics, Environmental Noise, and Vibration

4.4.1.1 Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as unwanted sound (i.e., loud, unexpected, or annoying sound). Acoustics is defined as the physics of sound. In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. Acoustics addresses primarily the propagation and control of sound.

4.4.1.2 Frequency

The number of sound pressure peaks travelling past a given point in a single second is referred to as the frequency, expressed in cycles per second or Hertz (Hz). A given sound may consist of energy at a single frequency (pure tone) or in many frequencies over a broad frequency range (or band). Human hearing is generally affected by sound frequencies between 20 Hz and 20,000 Hz.

4.4.1.3 Amplitude

The amplitude of pressure waves generated by a sound source determines the perceived loudness of that source. Sound pressure amplitude is measured in micro-Pascals (µPa). One µPa is approximately one hundred billionth of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 µPa to 100,000,000 µPa. Because of this huge range of values, sound is rarely expressed in terms of pressure. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of human hearing (near total silence) is approximately 0 dB which corresponds to 20 µPa.
4.4.1.4 Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic means. Under the decibel scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two sources are each producing sound of the same loudness, the resulting sound level at a given distance would be approximately 3 dB higher than one of the sources under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB – rather they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level of approximately 5 dB louder than one source, and ten sources of equal loudness together produce a sound level of approximately 10 dB louder than the single source.

4.4.1.5 A-Weighted Decibels

Figure 4.4-1 illustrates sound levels associated with common sound sources. The perceived loudness of sound is dependent on many factors, including SPL and frequency content. However, within the usual range of environmental sound levels, perception of loudness is relatively predictable, and can be approximated by frequency filtering using the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard descriptor for environmental noise assessment. All noise levels reported in this section are in terms of A-weighting.

4.4.1.6 Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3 dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in a laboratory setting, the trained, healthy human ear is able to discern 1 dB changes in sound levels when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency range (1,000 Hz–8,000 Hz). In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy that would result in a 3-dB increase in sound pressure level would generally be perceived as barely detectable. Refer to Table 4.4-1 for the approximate relationship between increases in environmental noise level and human perception.
<table>
<thead>
<tr>
<th>PUBLIC REACTION</th>
<th>NOISE LEVEL (dBA, Leq)</th>
<th>COMMON INDOOR NOISE LEVELS</th>
<th>COMMON OUTDOOR NOISE LEVELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL COMMITTEE ACTIVITY WITH INFLUENTIAL OR LEGAL ACTION</td>
<td>4 Times As Loud</td>
<td>- Rock Band</td>
<td>- Jet Flyover at 1000 Ft.</td>
</tr>
<tr>
<td>LETTERS OF PROTEST</td>
<td>Twice As Loud</td>
<td>- Inside Subway Train (New York)</td>
<td>- Gas Lawn Mower at 3 Ft.</td>
</tr>
<tr>
<td>COMPLAINTS LIKELY</td>
<td></td>
<td>- Food Blender at 3 Ft.</td>
<td>- Diesel Truck at 50 Ft.</td>
</tr>
<tr>
<td>COMPLAINTS POSSIBLE</td>
<td></td>
<td>- Garbage Disposal at 3 Ft.</td>
<td>- Noisy Urban Daytime</td>
</tr>
<tr>
<td>REFERENCE</td>
<td></td>
<td>- Shouting at 3 Ft.</td>
<td>- Gas Lawn Mower at 100 Ft.</td>
</tr>
<tr>
<td>COMPLAINTS RARE</td>
<td>1/2 As Loud</td>
<td>- Vacuum Cleaner at 10 Ft.</td>
<td>- Commercial Area</td>
</tr>
<tr>
<td>ACCEPTANCE</td>
<td>1/4 As Loud</td>
<td>- Large Business Office</td>
<td>- Heavy Traffic at 300 Ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Dishwasher Next Room</td>
<td>- Quiet Urban Daytime</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Small Theater, Large Library</td>
<td>- Quiet Urban Nighttime</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Conference Room (Background) Library</td>
<td>- Quiet Suburban Nighttime</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Concert Hall (Background)</td>
<td>- Quiet Rural Nighttime</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Broadcast and Recording Studio</td>
<td></td>
</tr>
</tbody>
</table>
4.4 Noise and Vibration

4.4.1.7 Noise Descriptors

Noise in our daily environments fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in environmental noise analysis, and are applicable to this study:

- **Equivalent Sound Level (Leq):** The Leq represents an average of the sound energy occurring over a specified time period. In effect, the Leq is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour, A-weighted equivalent sound level (Leq[h]) is the energy average of A-weighted sound levels occurring during a 1-hour period.

- **Maximum Sound Level (Lmax):** The Lmax is the highest instantaneous sound level measured during a specified period.

- **Day-Night Average Level (Ldn/DNL):** The Ldn or DNL is the energy-average of A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during nighttime hours (10 p.m. to 7 a.m.). The term “Ldn” is used from here on out throughout this section.

- **Community Noise Equivalent Level (CNEL):** Similar to the DNL, the CNEL is the energy average of A-weighted sound levels over a 24 hour period with a 5-dBA “penalty” added for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

4.4.1.8 Sound Propagation

Sound from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern; therefore, this type of propagation is called spherical spreading. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source as its energy is continuously spread out over a spherical surface (see Figure 4.4-2 for an illustration of...
spherical spreading of noise from a point source). Point sources of noise, such as stationary equipment or onsite construction equipment, attenuate (lessen) at a rate of 6.0 dBA per doubling of distance from the source. Noise attenuation from a point source increases by 1.5 dBA from 6.0 dBA to 7.5 dBA for each doubling of distance due to ground absorption and reflective wave canceling. These factors are collectively referred to as *excess ground attenuation*. The basic geometric spreading loss rate is used where the ground surface between a noise source and a receiver is reflective, such as parking lots or a smooth body of water. The excess ground attenuation rate (7.5 dBA per doubling of distance) is used where the ground surface is absorptive, such as soft dirt, grass, or scattered bushes and trees.

**4.4.1.9 Vibration**

Vibration is an oscillatory motion through a solid medium in which the motion’s amplitude can be described in terms of displacement, velocity, or acceleration. Several descriptors are typically used to quantify the amplitude of vibration including Peak Particle Velocity (PPV) and Root Mean Square (RMS) velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave and is typically expressed in units of inches per second (in/sec). The PPV is most frequently used to describe vibration impacts to buildings. RMS velocity is defined as the average of the squared amplitude of the signal, usually measured in decibels referenced to 1 microinch/second and are reported as VdB. The decibel notation acts to compress the range of numbers required to describe vibration (Federal Transit Administration [FTA], 2006). VdB vibration velocity amplitudes are used to evaluate human response to vibration. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where ground-borne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows. In urban environments, such as Sunnyvale, sources of ground-borne vibration include construction activities, light and heavy rail transit, and heavy trucks and buses. Typically,
ground-borne vibration generated by man-made activities attenuates rapidly with distance from
the source of the vibration.

**Construction Vibration**

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related ground-borne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess ground-borne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans. The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec, PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels such as people in an urban environment may tolerate a higher vibration level. Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Construction-induced vibration that can be detrimental to a building and has been observed in instances where the structure is in a high state of disrepair and the construction activity (e.g., impact pile driving) occurs immediately adjacent to the structure.

**Table 4.4-2** displays the human reactions and effects on buildings that can be caused by various continuous vibration levels. As discussed previously, annoyance is a subjective measure and vibrations may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations at the threshold of perception can be annoying.

<table>
<thead>
<tr>
<th>Velocity Level, PPV (in/sec)</th>
<th>Human Reaction</th>
<th>Effect on Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>Barely perceptible</td>
<td>No effect</td>
</tr>
<tr>
<td>0.04</td>
<td>Distinctly perceptible</td>
<td>Vibration unlikely to cause damage of any type to any structure</td>
</tr>
<tr>
<td>0.08</td>
<td>Distinctly to strongly perceptible</td>
<td>Recommended upper level of the vibration to which ruins and ancient monuments should be subjected</td>
</tr>
<tr>
<td>0.1</td>
<td>Strongly perceptible</td>
<td>Virtually no risk of damage to normal buildings</td>
</tr>
<tr>
<td>0.3</td>
<td>Strongly perceptible to severe</td>
<td>Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings</td>
</tr>
<tr>
<td>0.5</td>
<td>Severe – vibrations considered unpleasant</td>
<td>Threshold at which there is a risk of damage to newer residential structures</td>
</tr>
</tbody>
</table>

**SOURCE:** Caltrans, 2004
4.4.2 Setting

The Master Plan site encompasses the Sunnyvale WPCP, which is located at the southern end of the San Francisco Bay within the city of Sunnyvale, approximately 0.8 mile north of State Route 237 (SR 237). The Master Plan site includes the main plant as well as two oxidation ponds. Existing land uses surrounding the WPCP are primarily used for industrial and recreational purposes. The Sunnyvale Materials Recovery and Transfer Station (SMaRT Station®) is adjacent to the main plant to the east and the Sunnyvale Landfill (now closed) surrounds the main plant on the landward side (west, south, and east). A small section of the Bay Trail is located west of the plant. To the north lies the southern end of the San Francisco Bay. Directly south of SR 237 is a mix of residential and commercial land uses. Moffett Federal Airfield is about 1.5 miles to the west.

4.4.2.1 Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to noise levels than others due to the duration and nature of time people spend at these uses. In general, residences are considered most sensitive to noise as people spend extended period of time in them including the nighttime hours. Therefore noise impacts to rest and relaxation, sleep, and communication are highest at residential uses. Schools, hotels, hospitals, nursing homes, and recreational uses are also considered to be more sensitive to noise as activities at these land uses involve rest and recovery, relaxation and concentration, and increased noise levels tend to disrupt such activities. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate, are also sensitive to noise but due to the limited time people spend at these uses, impacts are usually tolerable. Commercial and industrial uses are considered the least noise-sensitive.

Ground vibration can be annoying to people. The primary effect of perceptible vibration is often a concern. However, secondary effects, such as the rattling of a china cabinet, can also occur, even when vibration levels are well below perception. Any effect (primary perceptible vibration, secondary effects, or a combination of the two) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping or reading will be more sensitive than someone who is running on a treadmill. Recurring primary and secondary vibration effects often lead people to believe that the vibration is damaging their home, although vibration levels can be well below minimum thresholds for damage potential. However, vibration generated by construction activity has the potential to damage structures. This damage could be structural damage, such as cracking of floor slabs, foundations, columns, beams, or wells, or cosmetic architectural damage, such as cracked plaster, stucco, or tile.

The immediate vicinity of the WPCP area does not contain residential land uses; the site is surrounded mostly by industrial and office uses. However, there are recreational uses in the vicinity of the WPCP such as the section of the Bay Trail that runs along parts of the northern and western boundaries of the plant as well as the Baylands Park, which is located less than a mile to
the east of the site. The nearest residential uses are the single family homes located immediately to the south of SR 237 and are located at least 0.8 mile from the Master Plan site.

### 4.4.2.2 Existing Ambient Noise Conditions

Noise sources at the WPCP include both stationary and mobile sources. Stationary sources emanate from a single point, whereas mobile sources are those that can move around or cannot be attributed to a single point. Mobile noise sources include cars and trucks on roads leading to the WPCP and aircraft activity from Moffett Federal Airfield. Stationary noise sources currently exist at the WPCP, including many sources associated with the power plant. Other stationary sources that affect noise at the WPCP include commercial and industrial uses south of the WPCP.

The noise environment at the residences south of SR 237 (most noise-sensitive receptors) is influenced primarily by traffic on SR 237 and adjacent local roadways. In addition, the San José Light Rail adds to the noise levels at some of the residences along North Fair Oaks Avenue. To quantify the existing ambient noise environment at these receptors, a long-term (24-hour) ambient noise measurement was taken adjacent to the residential development near the intersection of Fairoaks Way and North Fair Oaks Avenue.

In addition, to characterize the existing noise levels near the Master Plan site, one short-term noise measurement was conducted along the section of the Bay Trail that runs along the northwestern border of the WPCP’s main plant area. Noise measurement results for both study locations are summarized in Table 4.4-3.

<table>
<thead>
<tr>
<th>Location</th>
<th>Time Period</th>
<th>Noise Level</th>
<th>Noise Sources</th>
</tr>
</thead>
</table>
| ST-1: Along the Bay Trail near the northwestern corner of the main plant area | August 12, 2014 2:28 – 2:33 p.m. | 5-minute result: Leq = 57 dBA | • Pump noise from the WPCP  
• Activity of Bay Trail users  
• Wind  
• Birds |
| LT-1: Adjacent to residences at the intersection of North Fair Avenue and Fairoaks Way (nearest residential receptors) | August 11 – 12, 2014 | 24-hour result: Ldn = 60.5 dBA | • Traffic on SR 237  
• Traffic on offramp, Fairoaks Way, and N. Fair Oaks Ave.  
• Light rail |

a All noise levels measured in A-weighted decibels. Noise measurement data presented here using a Metrosonics dB-3080 sound level meter, calibrated prior to use.

Ambient noise level measurements were completed using Metrosonics, Inc. db-308 sound level meters equipped with ½-inch outdoor microphones. The measurement systems represent Type 2 (Class 2) instrumentation. The measurement analyzers were calibrated in the field immediately prior to the start of the measurement session using a Metrosonics, Inc. Model DL304 calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute (ANSI) for Type 2 sound level meters (ANSI S1.4).
4.4.3 Regulatory Setting
A summary of applicable key laws, regulations, and policies from applicable jurisdictions is presented below.

4.4.3.1 Federal Regulations

Occupational Safety and Health Act

Under the Occupational Safety and Health Act of 1970 (29 USC §651 et seq.), the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) adopted regulations (29 CFR §1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list limits on noise exposure levels as a function of the amount of time during which the worker is exposed (see Table 4.4-4). The regulations further specify requirements for a hearing conservation program (§1910.95(c)), a monitoring program (§1910.95(d)), an audiometric testing program (§1910.95(g)), and hearing protection §1910.95(i)). There are no federal laws governing community noise.

<table>
<thead>
<tr>
<th>Duration of Noise (hours/day)</th>
<th>A-Weighted Noise Level (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>95</td>
</tr>
<tr>
<td>3</td>
<td>97</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>1.5</td>
<td>102</td>
</tr>
<tr>
<td>1</td>
<td>105</td>
</tr>
<tr>
<td>0.5</td>
<td>110</td>
</tr>
<tr>
<td>0.25 or less</td>
<td>115</td>
</tr>
</tbody>
</table>

SOURCE: United States Environmental Protection Agency (U.S. EPA), 1974, Title 29 CFR §1910.95, Table G-16.

Although no federal noise regulations exist, the U.S. Environmental Protection Agency (EPA) has promulgated noise guidelines (U.S. EPA, 1974) The U.S. EPA guideline recommends a Ldn of 55 dB or less to protect the public from the effects of environmental noise outdoors in residential areas and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.

4.4.3.2 State Regulations

California Government Code §65302 encourages each local government entity to implement a noise element as part of its general plan. In addition, the California Governor’s Office of Planning and Research has developed guidelines for preparing noise elements, which include recommendations
for evaluating the compatibility of various land uses as a function of community noise exposure. In addition, the California Occupational Safety and Health Administration (Cal/OSHA) has promulgated Occupational Noise Exposure Regulations (Title 8 CCR §5096) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

The State of California has published guidelines for noise compatible land use planning. According to the guidelines, exterior noise exposures generally fall into three categories: normally acceptable, conditionally acceptable, and unacceptable. Each land use has a particular dBA range within each exterior noise exposure category. For residential uses, an exterior noise environment of less than 62.5 dBA L_{dn} or CNEL is considered “normally acceptable” while a noise environment of 62.5 to 77.5 dBA L_{dn} or CNEL is considered “conditionally acceptable.” For neighborhood parks, the General Plan guidelines indicate that an exterior noise environment of less than 65 dBA L_{dn} or CNEL is considered “normally acceptable,” between 65 dBA and 80 dBA L_{dn} or CNEL is considered “conditionally acceptable”, and 80 dBA or greater is considered “unacceptable.”

### 4.4.3.3 Local Policies

Most of the activities associated with the Master Plan would take place onsite at the WPCP and would therefore fall within the jurisdiction of the City of Sunnyvale. However, pipeline alignments, recharge basins, and injection wells associated with the WPF could fall within the jurisdictions of other cities south of the WPCP. Existing recharge basins that could be used for groundwater replenishment are located within the City of Campbell. The District has not determined the specific location of injection wells or pipelines, but these components of the WPF could be located in the Cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara. Policies and standards from these jurisdictions that are applicable to noise are presented below.

**City of Sunnyvale**

The Safety and Noise Element of the City of Sunnyvale General Plan contains goals and policies that relate to noise. Goals and policies applicable to the Master Plan are listed below (City of Sunnyvale, 2011):

**Goal SN-8**: Maintain or achieve a compatible noise environment for all land uses in the community.

- **Policy SN-8.4**: Prevent significant noise impacts from new development by applying State noise guidelines and Sunnyvale Municipal Code noise regulations in the evaluation of land use issues and proposals.
- **Policy SN-8.5**: Comply with “State of California Noise Guidelines for Land Use Planning” for the compatibility of land uses with their noise environments, except where the City determines that there are prevailing circumstances of a unique or special nature.
- **Policy SN-8.6**: Use Figure 6-6 of the General Plan (shown as Table 4.4-5 below), “Significant Noise Impacts from new Development on Existing Land Use” to determine if proposed development results in a “significant noise impact” on existing development.
- **Policy SN-8.9**: Consider techniques which block the path of noise and insulate people from noise.
TABLE 4.4-5
SIGNIFICANT NOISE IMPACT FROM NEW DEVELOPMENT ON EXISTING LAND USE

<table>
<thead>
<tr>
<th>Ln Category of Existing Development, dB</th>
<th>Noise Increase Considered Significant over Existing Noise Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normally acceptable</td>
<td>An increase of more than 3 dBA and the total L_{den} exceeds the</td>
</tr>
<tr>
<td></td>
<td>“normally acceptable” category</td>
</tr>
<tr>
<td>Normally acceptable</td>
<td>An increase of more than 5 dBA</td>
</tr>
<tr>
<td>Conditionally acceptable</td>
<td>An increase of more than 3 dBA</td>
</tr>
<tr>
<td>Unacceptable</td>
<td>An increase of more than 3 dBA</td>
</tr>
</tbody>
</table>

SOURCE: City of Sunnyvale, 2011

City of Sunnyvale Municipal Code
The Municipal Code sets noise standards for construction (Title 16), and operation (Title 19), equipment and maintenance as follows (City of Sunnyvale, 2015):

16.08.030. Hours of construction—Time and noise limitations
Construction activity shall be permitted between the hours of 7:00 a.m. and 6:00 p.m. daily Monday through Friday. Construction on Saturdays shall be limited to the hours between 8:00 a.m. and 5:00 p.m. There shall be no construction activity on Sunday or national holidays when city offices are closed. Where additional construction activity will not be a nuisance to surrounding properties, based on location and type of construction, a waiver may be granted to allow hours of construction other than as stated in this section. (Ord. 2930-10 §2).

19.42.030. Noise or sound level. (Not for construction activities)
(a) Operational noise shall not exceed 75 dBA at any point on the property line of the premises upon which the noise or sound is generated or produced; provided, however, that the noise or sound level shall not exceed 50 dBA during nighttime or 60 dBA during daytime hours at any point on adjacent residentially zoned property. If the noise occurs during nighttime hours and the enforcing officer has determined that the noise involves a steady, audible tone such as a whine, screech or hum, or is a staccato or intermittent noise (e.g., hammering) or includes music or speech, the allowable noise or sound level shall not exceed 45 dBA.

(b) Powered equipment used on a temporary, occasional or infrequent basis which produces a noise greater than the applicable operational noise limit set forth in subsection (a) shall be used only during daytime hours when used adjacent to a property with a residential zoning district. Powered equipment used on other than a temporary, occasional or infrequent basis shall comply with the operational noise requirements. For the purpose of this section, powered equipment does not include leaf blowers. Construction activity regulated by Title 16 of this code shall not be governed by this section.

(c) It is unlawful for any person to make or allow to be made a nighttime delivery to a commercial or industrial establishment when the loading/unloading area of the
establishment is adjacent to a property in a residential zoning district. Businesses legally operating at a specific location as of February 1, 1995, are exempt from this requirement.

City of San José

The Envision San José 2040 General Plan minimizes the impact of new development on land uses sensitive to increased noise levels (Residential, Hotels and Motels, Hospitals, Residential Care, Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds, Schools, Libraries, Museums, Meeting Halls, Churches, Public and Quasi-Public Auditoriums, Concert Halls, and Amphitheaters) by limiting noise generation and by requiring use of noise attenuation measures such as acoustical enclosures and sound barriers where feasible. The City of San José considers significant noise impacts to occur if a project would

- Cause the DNL at noise sensitive receptors to increase by five dBA DNL or more where the noise levels would remain “Normally Acceptable” or
- Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where noise levels would equal or exceed the “Normally Acceptable” level.

City of San José Municipal Code

The City of San José Municipal Code establishes noise exposure limits for stationary noise sources (non-transportation sources) and specifies hours for Master Plan improvement construction (City of San José, 2015):

Sections 20.20.300, 20.30.700, 20.40.600, and 20.50.300. These sections of the City’s Municipal Code establish performance standards for noise exposure associated with stationary/non-transportation sources at the property line of noise-sensitive uses. Specifically, noise exposure is limited to 55 dB, 60 dB, and 70 dB at the property line of residential, commercial, and industrial receivers. Although the Code is not explicit with respect to the acoustical descriptor assigned to these noise levels, it is a reasonable interpretation that these levels may be applied to an hourly average noise level (Hourly Leq). This assumption is consistent with other jurisdictions in the Bay Area and northern California.

Section 20.100.450. Hours of construction within 500 feet of a residential unit

A. Unless otherwise expressly allowed in a development permit or other planning approval, no applicant or agent of an applicant shall suffer or allow any construction activity on a site located within 500 feet of a residential unit before 7 a.m. or after 7 p.m., Monday thru Friday, or at any time on weekends.

B. Without limiting the scope of Section 20.100.310, no applicant or agent of an applicant shall suffer or allow any construction activity on a site subject to a development permit or other planning approval located within 500 feet of a residential unit at any time when that activity is not allowed under the development permit or planning approval.

C. This section is applicable whenever a development permit or other planning approval is required for construction activity.
City of Campbell

Section 18.04.052 of the City of Campbell Municipal Code restricts construction activity to the hours of 8 a.m. and 5 p.m. daily, Monday through Friday and 9 a.m. to 4 p.m. on Saturdays. Construction is not permitted on Sundays or National Holidays (City of Campbell, 2015).

City of Cupertino

With the exception of emergencies, Section 10.48.053 of the Cupertino Municipal Code restricts construction, demolition or underground utility work taking place with 750 feet from a residential area to the daytime hours of 7 am to 8 pm on weekdays. No construction other than street construction is allowed on weekends and legal holidays (City of Cupertino, 2015). In addition, the ordinance requires that construction equipment utilized has high-quality noise muffler and abatement devices installed and in good condition, and the activity meets one of the following two criteria:

- No individual device produces a noise level more than 87 dBA at a distance of 25 feet (7.5 meters); or
- The noise level on any nearby property does not exceed 80 dBA.

City of Saratoga

Section 7-30.060 of the Saratoga Municipal Code restricts noise from construction, alteration, repair, and grading activities to one hundred dBA as measured at any point twenty-five feet or more from the source of noise (City of Saratoga, 2015). Such activities are limited to the hours of 7:30 A.M. through 6:00 P.M. on weekdays and between the hours of 9:00 A.M. and 5:00 P.M. on Saturdays. Construction activities are prohibited on Sundays and weekday holidays.

City of Santa Clara

The Santa Clara Municipal Code does not provide quantitative limits for noise from construction equipment but restricts construction activity taking place within 300 feet of any residentially zoned area to the hours of 7 am to 6 pm on weekdays (that are not holidays) and to the hours of 9 am to 6 pm on Saturdays. Construction is not allowed on Sundays and holidays (City of Santa Clara, 2015).

4.4.4 Impacts and Mitigation Measures

4.4.4.1 Thresholds of Significance

For the purposes of this EIR, a noise or vibration impact is considered significant if implementation of the proposed project would:

- Result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
4. Environmental Setting, Impacts, and Mitigation Measures

4.4 Noise and Vibration

- Result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels; or
- For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

4.4.4.2 Approach to Analysis

This section addresses noise and vibration impacts associated with construction and operation of the proposed Master Plan and the WPF with regard to potential effects on noise-sensitive receptors, and identifies measures necessary to mitigate significant impacts. Impacts to wildlife resulting from Master Plan noise and vibration are evaluated in Section 4.7, Biological Resources.

As discussed in Chapter 3, Project Description, implementation of the Master Plan would include retrofitting existing facilities, constructing new facilities, changing processes, and demolishing outdated structures (WPCP improvements). Under the WPF, the City would collaborate with Santa Clara Valley Water District (District) and produce purified water at the WPF. The purified water would be injected into the ground to replenish groundwater reserves. Both the WPCP improvements and the WPF are evaluated at a program level of detail. Additional CEQA analysis would be conducted when individual improvements are proposed to be implemented under the Master Plan and WPF. The following approach to analyses is applied to determine the level of impact associated with the implementation of the proposed Master Plan and WPF.

Demolition/Construction Noise and Vibration (Short-term)

As discussed earlier, the City of Sunnyvale does not identify, as part of its General Plan Noise Element or Municipal Code, any quantitative criteria or noise limits for the evaluation of demolition/construction noise impacts at neighboring noise-sensitive uses. Rather, the City primarily restricts the hours of construction activity to the less noise-sensitive daytime hours of 7:00 a.m. to 6:00 p.m. on weekdays and to the hours between 8:00 a.m. and 5:00 p.m. on Saturdays with no construction activity on Sundays or national holidays. A project normally would result in a significant impact if proposed construction and demolition activities would take place outside these hours. Likewise, when construction related to the WPF takes place in other jurisdictions outside Sunnyvale, the significance of impacts would be based on compliance with applicable general plan and noise ordinance standards with respect to construction hours and quantitative criteria for noise limits. Any temporary Master Plan construction noise would be considered significant if it increased ambient noise levels above existing noise levels in the WPCP vicinity.
The City of Sunnyvale does not specify vibration limits for construction activities. Based on guidance from Caltrans, the PPV threshold of 0.20 in/sec is used in this analysis to determine the significance of vibration impacts related to adverse human reaction (Caltrans, 2004), and the FTA PPV thresholds of 0.50 in/sec for reinforced-concrete, steel or timber (no plaster), and 0.20 in/sec for non-engineered timber and masonry buildings are used to determine the significance of vibration impacts related to risk of architectural damage to buildings (FTA, 2006). This criterion is considered at locations where Master Plan demolition/construction requires the operation of substantial impact equipment/operations (e.g., pile driving). Typical, non-impact construction equipment operations would not be expected to produce vibration levels in excess of 0.21 in/sec PPV at a distance of 25 feet (Caltrans, 2004). Therefore, at neighboring uses, vibration levels due to non-impact Master Plan construction are not expected to exceed the applicable threshold.

**Operational Noise (Long-term)**

Consistent with Policy SN-8.6 of the General Plan Noise Element, in existing development nearby, where the noise environment is in the normally acceptable range according to the land use/noise compatibility guidelines, a noise increase of greater than 5 dBA Ldn or CNEL would be considered significant while for existing development in “conditionally acceptable” and “unacceptable” noise environments, a noise increase of greater than 3 dBA would be considered a significant noise increase. Noise exposure in excess of this threshold would not satisfy the City’s determination of land-use compatibility or noise exposure quality and would constitute a significant impact.

For the reasons described below, there would be no impacts related to the following criteria:

**Threshold of Significance**: Would the project be located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?

The WPCP is located approximately 1.5 miles east of Moffett Federal Airfield, also known as Moffett Field, a joint civil-military airport. Noise from aircraft activity at Moffett Field would be a source of noise contributing to the noise environment at the WPCP. However, the WPCP is located outside the 65 dBA contour for the airfield and hence would be normally acceptable for the proposed uses with respect to noise. There would be no impact associated with this topic and it is not examined further.

**Threshold of Significance**: Would the project be located in the vicinity of a private airstrip or where the project would expose people residing or working in the project area to excessive noise levels?

There are no private airstrips in the vicinity of the WPCP. Therefore, this topic is not further examined as there would be no impact associated with this threshold.

**4.4.4.3 Impact Summary**

Table 4.4-6 lists the project’s noise and vibration-related impacts and significance determinations.
4.4.4.4 Master Plan Impacts and Mitigation Measures

Impact NOI-1: Demolition and construction associated with the implementation of the WPCP improvements would result in temporary increases in ambient noise levels in the WPCP vicinity above existing noise levels and could generate noise levels in excess of standards established in the City of Sunnyvale General Plan and Municipal Code, a less-than-significant impact with mitigation.

Construction of proposed improvements to treatment operations would involve several general types of activities: demolition or rehabilitation of some existing facilities and site clearing; earthwork (grading, excavation, sheet pile driving, and groundwater dewatering); and facility construction. Construction activities are typically short term and intermittent resulting in temporary noise impacts to nearby receptors. However, implementation of the Master Plan would involve construction activities associated with various improvements over an extended time period of more than 20 years. Construction would occur throughout the year over Master Planning Period (to 2035). During the construction period for each improvement there would be periods of more intensive activity, followed by longer periods of reduced activity.

Noise generated from construction equipment varies greatly depending on factors such as phase of construction, types, size and number of equipment being used, model, age, and condition of the equipment. Noise associated with heavy equipment diesel engine operations often dominates the noise environment in the vicinity of construction sites. Stationary sources such as generators, pumps, and compressors may also contribute to overall construction noise. Maximum noise levels from typical construction equipment is approximately 75 to 90 dB ($L_{max}$ at 50 feet). Noise from typical construction is generally not expected to exceed 90 dB at 50 feet. Table 4.4-7 shows typical construction noise levels for various equipment.
### 4. Environmental Setting, Impacts, and Mitigation Measures

#### 4.4 Noise and Vibration

**TABLE 4.4-7**

**TYPICAL NOISE LEVELS FROM DEMOLITION/CONSTRUCTION EQUIPMENT OPERATIONS**

<table>
<thead>
<tr>
<th>Construction Equipment</th>
<th>Noise Exposure Level, dB Lmax @ 50 Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Compressor</td>
<td>78</td>
</tr>
<tr>
<td>Auger drill rig</td>
<td>84</td>
</tr>
<tr>
<td>Backhoe</td>
<td>78</td>
</tr>
<tr>
<td>Compactor</td>
<td>83</td>
</tr>
<tr>
<td>Concrete Mixer Truck</td>
<td>79</td>
</tr>
<tr>
<td>Concrete Pump Truck</td>
<td>81</td>
</tr>
<tr>
<td>Concrete Saw</td>
<td>90</td>
</tr>
<tr>
<td>Crane</td>
<td>81</td>
</tr>
<tr>
<td>Drill rig truck</td>
<td>79</td>
</tr>
<tr>
<td>Dozer</td>
<td>82</td>
</tr>
<tr>
<td>Dump Truck</td>
<td>76</td>
</tr>
<tr>
<td>Excavator</td>
<td>81</td>
</tr>
<tr>
<td>Flat Bed Truck</td>
<td>74</td>
</tr>
<tr>
<td>Front End Loader</td>
<td>79</td>
</tr>
<tr>
<td>Generator</td>
<td>81</td>
</tr>
<tr>
<td>Grader</td>
<td>85</td>
</tr>
<tr>
<td>Impact Wrench</td>
<td>85</td>
</tr>
<tr>
<td>Jack Hammer</td>
<td>89</td>
</tr>
<tr>
<td>Paver</td>
<td>77</td>
</tr>
<tr>
<td>Pavement Scarifier</td>
<td>90</td>
</tr>
<tr>
<td>Pile Driver (Impact)</td>
<td>101</td>
</tr>
<tr>
<td>Pile Driver (Sonic)</td>
<td>96</td>
</tr>
<tr>
<td>Pneumatic Tool</td>
<td>85</td>
</tr>
<tr>
<td>Pump</td>
<td>81</td>
</tr>
<tr>
<td>Roller</td>
<td>80</td>
</tr>
<tr>
<td>Scraper</td>
<td>84</td>
</tr>
<tr>
<td>Welder/Torch</td>
<td>74</td>
</tr>
</tbody>
</table>

**SOURCE:** Federal Highway Administration, 2006.

Construction equipment would likely generate temporary noise above the levels measured near the WPCP. The nearest potential receptors to experience the temporary increases in noise would be recreational, office, and industrial facility users surrounding the WPCP site, which would be affected during daytime hours due to their proximity to the WPCP. They would not be affected by any evening and nighttime construction as these uses are typically not occupied during nighttime hours. Impacts to recreational uses would be considered less than significant as the receptors at these uses are transient and are not likely to be exposed to extended periods of elevated noise levels from Master Plan construction. Impacts to industrial and office uses would also be less than significant as these uses are not considered noise-sensitive.

As discussed earlier, residential uses closest to the WPCP would be located approximately 0.8 mile (approximately 4,200 feet) away from any construction activities at the WPCP. Existing ambient
noise levels at these residences was measured to be in the “normally acceptable” range at 60.5 dBA, $L_{dn}$. At this distance, noise from even the highest noise generating construction equipment (pile driving) would attenuate significantly and would be barely audible over the ambient noise environment. As shown in Table 4.4-7, pile drivers generate maximum noise levels of 101 dB $L_{max}$ at 50 feet. At a distance of 4,200 feet, this noise level would attenuate to 62 dB based on a conservative assumption that noise level reduces by 6 dB for every doubling of distance. The actual attenuation would be higher due to physical barriers (such as buildings and the landfills south of the WPCP) blocking the line of sight between the construction noise source and the residential receptors. Measured daytime $L_{eq}$ at the residences range between 57 and 61 dBA and so the attenuated maximum construction noise of 62 dBA would not be audible over the existing noise levels at these residences (it takes a change of at least 3 dBA for noise changes to be perceptible to people).

As noted above, during the construction period for each improvement there would be periods of more intensive activity, including the potential for multiple improvements to undergo construction at the same time. Due to the small size of the WPCP and the need to maintain operations 24 hours per day, seven days per week throughout the duration of construction activities, it is unlikely that no more than two large contractors can work on the site simultaneously. Assuming simultaneous operation of two of the noisiest pieces of construction equipment shown in Table 4.4-7, the combined construction noise level of 101.3 dBA would still attenuate to 62 dBA at the nearest residences, and not be perceptible over the existing ambient $L_{dn}$ of 60.5 dBA. Therefore, estimated construction noise exposure associated with WPCP improvements would not be expected to significantly exceed ambient noise levels at the nearest residential uses.

Truck trips to haul construction-related material to and from the site could take place during evening and nighttime hours to avoid congestion along the haul routes. As a result, noise receptors along these haul routes would be affected, especially during the more noise-sensitive evening and nighttime hours and if haul trucks travel through or adjacent to any residential areas. The majority of construction truck traffic associated with proposed WPCP improvements is expected to use SR 237 and Caribbean Drive north of SR 237. There are no residential areas located along this route to the WPCP that could be affected by this construction traffic. Construction trucks using SR 237 would not be expected to add significantly to the existing 3,700+ daily heavy truck operations on the highway. However, construction trucks could also use U.S. Highway 101 and potentially travel through some residential neighborhoods south of SR 237, which could significantly affect noise levels at these sensitive receptors. Implementation of Mitigation Measure NOI-1, Develop and Implement Construction Noise Logistics Plan, would ensure that the impact from construction-related truck trips along haul route would be less than significant to residential uses.

As discussed earlier, there are no quantitative thresholds provided by the City of Sunnyvale General Plan Noise Element or the Municipal Code that can be used for the evaluation of construction noise impacts. Demolition and construction activities associated with the Master Plan would generally take place within the hours allowed by the Municipal Code. These time and noise limitations apply only to noise from construction activities at the site and not construction related mobile sources such as trucks traveling on roadways to reach the site. However, at times when critical connections are to be made between the existing and new
facilities, construction activities may need to occur outside the hours allowed in the Municipal Code. This would lead to a significant noise impact. Implementation of Mitigation Measure NOI-1 would ensure that the impact from construction activities would be less than significant

**Mitigation Measures**

**Mitigation Measure NOI-1: Develop and Implement Construction Noise Logistics Plan**

For any Master Plan improvements involving construction activities at, or truck trips to or from, the WPCP between the hours of 6:00 p.m. and 7:00 a.m., the City will incorporate into the contract specifications required compliance with a Construction Noise Logistics Plan developed by the City or its contractor, which will specify hours of construction, identify noise and vibration minimization measures, require posting or notification of construction schedules and hours, and identify a designated noise disturbance coordinator who shall respond to noise complaints. The Plan shall include measures such as, but not limited to the following:

- Consistent with Section 16.08.030 of the Sunnyvale Municipal Code, all noise generating construction activities at the project site shall be limited to the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday and between 8:00 a.m. and 5:00 p.m. on Saturdays as much as possible. There shall be no construction activity at the project site on Sundays and national holidays when city offices are closed. Any critical construction activities that will need to take place outside the hours stated above shall be completed as expeditiously as possible to reduce the duration of the impact. No extreme noise generating activities at the project site shall take place outside the hours listed above.

- Any onsite construction activities that will need to take place outside the above mentioned hours will need prior approval from the City.

- Signs shall be posted at the construction site that include construction days and hours, a day and evening contact number for the job site, and a day and evening contact number for the City in the event of problems.

- All construction vehicles and equipment, fixed and mobile, shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds, wherever feasible).

- Construction staging areas shall be located as far as practicable from existing recreational uses so as to cause minimal disruption to these activities.

  Construction traffic to and from the project site shall be routed via designated truck routes that use freeways to the extent possible. Trucks shall not traverse through or adjacent to any residential areas, including along Lawrence Expressway, between the hours of 6:00 p.m. and 7:00 a.m. Preferred access to the site shall be from SR-237 through Caribbean Drive or North Mathilda Avenue.

- Prohibit unnecessary idling of internal combustion engines.

**Conclusion:** Less than Significant with Mitigation.
Impact NOI-2: Construction and operation of the WPCP improvements under the Master Plan would not expose persons to or generate excessive groundborne noise or vibration, a less-than-significant impact.

The duration and amplitude of vibration generated by construction equipment varies widely depending on the type of equipment and the purpose for which it is being used. The vibration from blasting has a high amplitude and short duration; whereas vibration from grading is lower in amplitude but longer in duration. Equipment or activities typical of continuous vibration include excavation equipment, static compaction equipment, tracked vehicles, traffic on a highway, sonic and vibratory pile drivers\(^1\), pile-extraction equipment, and vibratory compaction equipment. Equipment or activities typical of single-impact (transient) or low-rate repeated impact vibration include impact pile drivers, blasting, drop balls, “pogo stick” compactors, and crack-and-seat equipment. Equipment typical of high-rate repeated impact vibration includes jackhammers and pavement breakers.

Activities necessary to implement the Master Plan improvements would include the demolition and removal of existing structures and pavement, site preparation work, foundation work, and erection of new buildings and structures. Vibration levels perceptible to adjacent properties may be generated when heavy equipment such as impact or vibratory tools (e.g., pile drivers, jackhammers) is used near the WPCP site boundaries. Construction would cause excessive vibration if sonic or vibratory pile driving is used to construct building foundations in the eastern portions of the main plant site or in the oxidation ponds, or for the flood wall. Table 4.4-8 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>PPV at 25 feet (in/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pile Driver (Impact)</td>
<td>1.518 (upper range)</td>
</tr>
<tr>
<td></td>
<td>0.65 (typical)</td>
</tr>
<tr>
<td>Pile Driver (Sonic)</td>
<td>0.734 (upper range)</td>
</tr>
<tr>
<td></td>
<td>0.17 (typical)</td>
</tr>
<tr>
<td>Clam shovel drop</td>
<td>0.202</td>
</tr>
<tr>
<td>Large Bulldozer</td>
<td>0.089</td>
</tr>
<tr>
<td>Caisson drilling</td>
<td>0.089</td>
</tr>
<tr>
<td>Loaded trucks</td>
<td>0.076</td>
</tr>
<tr>
<td>Jackhammer</td>
<td>0.035</td>
</tr>
<tr>
<td>Small bulldozer</td>
<td>0.003</td>
</tr>
<tr>
<td>Vibratory Roller</td>
<td>0.210</td>
</tr>
<tr>
<td>Hoe Ram</td>
<td>0.089</td>
</tr>
</tbody>
</table>

**Table 4.4-8**

VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

SOURCE: Federal Transportation Administration, 2006

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\(^1\) A sonic pile driver operates by continuously shaking the pile at a fixed frequency. Vibratory pile drivers operate on the same principle but vibrate at a different frequency than sonic pile drivers.
Master Plan construction activities such as drilling, the use of pile drivers, jackhammers, rock drills, and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Erection of building structures is not anticipated to be a source of substantial vibration with the exception of sporadic events such as dropping of heavy objects. Vibration levels would vary depending on site-specific conditions such as soil conditions, construction methods, and equipment used.

The PPV threshold of 0.20 in/sec identified by Caltrans (2004) is used in this analysis to determine the significance of vibration impacts related to adverse human reaction, and the FTA PPV threshold of 0.50 in/sec for reinforced-concrete, steel or timber (no plaster), and 0.20 in/sec for non-engineered timber and masonry buildings are used to determine the significance of vibration impacts related to risk of architectural damage to buildings (FTA, 2006). Vibration-generating activities associated with floodwall construction would occur within 50 feet of the nearest adjacent structures (towers supporting electrical lines) outside of the main plant. At this distance, vibration levels from pile driving equipment would attenuate to 0.30 in/sec PPV, which is below the FTA PPV thresholds of 0.50 in/sec for reinforced steel. Vibration generated by construction activities near the western site boundary could be perceptible to users of the Bay Trail. However, this impact would be less than significant as the Bay Trail users are considered transient receptors who would not be exposed to these vibration levels for long periods of time. Furthermore, as with any type of construction, limited exposure to vibration would be anticipated and it would not be considered significant given the intermittent and short duration of the construction activities that have the highest potential of producing vibration (demolition, use of jackhammers, pile drivers and other high power tools at the WPCP perimeter). Therefore, this would be considered a less-than-significant impact.

Implementation of the Master Plan would not change the number of employees at the WPCP. The frequency of daily truck trips to and from the WPCP would remain about the same, approximately six trucks per day. Operation and maintenance of the Master Plan improvements would not introduce any new sources of perceivable groundborne vibration to the WPCP area. Therefore, there would be no operation-related vibration impacts.

**Mitigation:** None required.

**Impact NOI-3:** Daily operational activities associated with the Master Plan would not result in a substantial permanent increase in ambient noise levels above existing levels, a less-than-significant impact.

The main operational noise sources that would occur under the WPCP Master Plan would be two newly installed 800 kW power generation engines in the power generation facility and a second 2,500 kW standby diesel generator. Equipment such as blowers in aeration basins and pumps used to convey the effluent between primary, secondary, and tertiary treatment processes would also contribute to operational noise.
The exact specifications for these proposed improvements have not yet been determined; however, engine generators of this capacity generally operate at a maximum noise level of 91 dBA at 25 feet (Cummins, 2015). At a distance of 5,000 feet, which represents the distance between the proposed generator engines and the closest residences south of SR 237, the attenuated generator engine noise would be approximately 45 dBA. In addition to the new cogeneration/digestion improvements, some of the proposed WPCP improvements would require the installation of new pumps. Based on data collected by ESA, municipal water pump motors produce a maximum noise level of approximately 76 dBA at 50 feet, which equates to 37.5 dBA at 4,200 feet, the approximate distance from the WPCP’s southern boundary to the residences. Much of this equipment would replace existing equipment and would be housed within enclosures that would provide additional noise attenuation. With the simultaneous and continuous operation of the proposed two power generation engines and two municipal water pump motors at the WPCP, the attenuated noise level at the nearest residences would be up to 55.1 L_{dn}. Given that physical barriers such as intervening buildings and the landfill south of Carl Road would block the line of sight between the WPCP noise sources and receptors providing additional attenuation to the effect of at least 10 dBA, operational noise associated with proposed facilities at the WPCP would not be expected to be audible over the existing ambient noise level at the residences, measured to be 60.5 dBA L_{dn} (refer to Table 4.4-3), which is dominated by traffic on SR 237 and light rail activity. The resulting noise levels would not exceed the ambient noise level at the nearest residences by greater than 5 dBA. The impact would be less than significant.

Build-out of the proposed Master Plan would not be expected to increase the number of employees at the WPCP. Some additional truck trips would be generated for material deliveries and hauling of residuals. Traffic associated with chemical deliveries to the WPCP would be about 42 deliveries per month and the hauling away of residuals (e.g., biosolids, grit) would result in an additional 19 trucks per week. The majority of these trips would be from SR 237, traveling north to the WPCP and away from any residential uses south of SR 237. This small increase in traffic would not be expected to significantly increase traffic related noise levels along these roadways. Generally, a doubling of traffic volume is necessary to increase associated noise levels by 3 dBA, which is generally the smallest noise increase perceptible to people. Therefore, this impact from increase in Master Plan related traffic is considered less than significant.

Mitigation: None required.

### 4.4.4.5 WPF Impacts and Mitigation Measures

Impact WPF-NOI-1: Demolition and construction associated with the WPF would result in a temporary increase in ambient noise levels in the project vicinity, a significant impact.

**WPF at the WPCP**

Construction of proposed WPF components at the WPCP would involve the same type of construction activities and the same type of construction equipment as the WPCP improvements.
under the Master Plan. Therefore, noise impacts from demolition and construction activities associated with the WPF at the WPCP would be similar to those discussed under Impact NOI-1 above. Due to the distance separating the residential receptors from the WPCP, construction noise levels even during peak activity would attenuate to less than ambient levels at these residences. Recreational, commercial and light industrial uses surrounding the WPCP are considered less sensitive to noise than residential uses. However, any noise impacts from demolition and construction at the WPCP to these uses would be mitigated to a less than significant level with the implementation of Mitigation Measure WPF-NOI-1a (Construction Noise Logistics Plan).

However, construction activities under the WPF would not be limited to the WPCP site. Under the WPF, purified water would be conveyed from Sunnyvale WPCP to facilities to the south of the WPCP. Existing recharge basins that could be used for groundwater replenishment are within the City of Campbell. Locations of injection wells and pipeline alignments between the WPCP, the injection well siting area, and the recharge basins have not been determined but could be located in the Cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara. The locations of injection wells and new pipeline alignments have not been identified to date. As planning progresses the District would confirm whether existing pipelines would be repurposed for conveying the purified water to the injection wells and recharge basins, or whether a new pipeline or pipelines would be constructed. Additional project level CEQA analysis would be conducted at that point to identify any impacts not identified in the program level analysis presented below.

**Pipelines**

If new pipelines are proposed, construction would mostly likely occur within existing public streets using the open trenching method. Open trench construction involves locating utilities/potholing, saw cutting the pavement, excavating a trench, removing and stockpiling the soils, installing the pipeline, backfilling the trench and repaving. Typical construction equipment associated with installation of pipelines include pavement saws, jack hammers, excavators, backhoes, dump trucks, front-end loaders, forklifts, flatbed delivery trucks, mobile concrete batch plants, soil-cement mixing machines, paving equipment (asphalt and/or concrete trucks, rollers), water trucks, and vibratory compactors. Trenchless pipeline installation such as bore and jack could also be used to construct new pipelines to avoid disruption of surface features like creeks or major streets. Depending on the proximity of noise-sensitive receptors to the proposed pipeline alignments, significant noise impacts could occur. Pipelines could be located in Sunnyvale, Santa Clara, Cupertino, San José, and Campbell. Section 4.4.3.3 describes the noise ordinance requirements for these jurisdictions. Implementation of Mitigation Measure WPF-NOI-1a, Noise and Vibration Reduction Plan for Construction of Pipelines and Injection Wells, would reduce this impact to less than significant.

**Injection Wells**

Construction of injection wells would involve site preparation activities such as grading, demolition (if needed), and drilling. Wells could be located in San José, Campbell, or Saratoga (see Figure 4.2-1). Noise ordinances and policies for these jurisdictions include hourly restrictions
4.4 Noise and Vibration

Mitigation Measures

Mitigation Measure WPF-NOI-1a: Develop and Implement Construction Noise Logistics Plan

For any WPF improvements involving construction activities at, or truck trips to or from, the WPCP between the hours of 6:00 p.m. and 7:00 a.m., the District will incorporate into the contract specifications a Construction Noise Logistics Plan developed by the District or its contractor, which will specify hours of construction, identify noise and vibration minimization measures, require posting or notification of construction schedules and hours, and identify a designated noise disturbance coordinator who shall respond to noise complaints. The Plan shall include measures such as, but not limited to the following:

- Consistent with Section 16.08.030 of the Sunnyvale Municipal Code, all noise generating construction activities at the project site shall be limited to the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday and between 8:00 a.m. and 5:00 p.m. on Saturdays as much as possible. There shall be no construction activity at the project site on Sundays and national holidays when city offices are closed. Any critical construction activities that will need to take place outside the hours stated above shall be completed as expeditiously as possible to reduce the duration of the impact. No extreme noise generating activities at the project site shall take place outside the hours listed above.
4. Environmental Setting, Impacts, and Mitigation Measures
4.4 Noise and Vibration

- Any onsite construction activities that will need to take place outside the above mentioned hours will need prior approval from the City.

- Signs shall be posted at the construction site that include construction days and hours, a day and evening contact number for the job site, and a day and evening contact number for the District in the event of problems.

- All construction vehicles and equipment, fixed and mobile, shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds, wherever feasible).

- Construction staging areas shall be located as far as practicable from existing recreational uses so as to cause minimal disruption to these activities.

- Construction traffic to and from the project site shall be routed via designated truck routes that use freeways to the extent possible. Trucks shall not traverse through or adjacent to any residential areas, including along Lawrence Expressway, between the hours of 6:00 p.m. and 7:00 a.m. Preferred access to the site shall be from SR-237 through Caribbean Drive or North Mathilda Avenue.

- Prohibit unnecessary idling of internal combustion engines.

Mitigation Measure WPF-NOI-1b: Noise and Vibration Reduction Plan for Construction of Pipelines and Injection Wells

Prior to commencement of construction, as part of the subsequent project level CEQA analysis, a Noise and Vibration Reduction Plan shall be developed that includes, but is not limited to the following components:

- Construction activities shall comply with the hours and standards specified by the applicable local noise ordinance(s)

- All construction equipment shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds, wherever feasible) to meet relevant noise limitations.

- Maximize physical separation, as far as practicable, between noise sources (construction equipment) and noise receptors. Separation may be achieved by providing enclosures for stationary items of equipment and noise barriers around noisy areas at the project sites and by locating stationary equipment to minimize noise impacts on the community.

- To prevent cosmetic or structural damage to adjacent or nearby structures, the District will incorporate into contract specifications restrictions on construction for wells or pipelines whereby surface vibration will be limited to no more than 0.50 in/sec PPV, measured at the nearest reinforced-concrete, steel, or timber (no plaster) buildings and no more than 0.20 in/sec PPV, measured at the nearest non-engineered timber and/or masonry buildings. A noise disturbance coordinator shall be assigned who shall respond to any noise complaints from the community.
• Signs shall be posted at the construction site that include construction days and hours, a day and evening contact number for the job site, and a day and evening contact number for the local jurisdiction in the event of problems.

• Utilize construction noise barriers such as paneled noise shields, movable barriers, or enclosures adjacent to or around noisy equipment associated with construction activities in the immediate vicinity (i.e., within 200 feet) of sensitive receptors. Noise control shields shall be made featuring a solid panel and a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.

• Prohibit unnecessary idling of internal combustion engines.

All components of the Noise Reduction Plan shall be incorporated into the design of or contract specifications for the WPF pipelines and injection wells.

Mitigation Measure WPF-NOI-1c: Nighttime Noise and Nuisance Reduction Plan

In the event that construction activity is determined to be necessary within 1,000 feet of sensitive receptors outside the hours of construction allowed for in the applicable local noise ordinance where construction would take place, the District shall require the contractor to develop a Nighttime Noise and Nuisance Reduction Plan. The plan shall include a set of site-specific noise attenuation measures that apply state-of-the-art noise reduction technology to ensure that nighttime construction noise levels and associated nuisances are reduced to the extent feasible. All noise attenuation measures shall be incorporated into the design of or contract specifications for the WPF pipelines and injection wells. If the local noise ordinance does not contain construction hour restrictions, this mitigation shall apply to construction activities taking place between the hours of 10 pm and 7 am. The attenuation measures included in the Plan shall include, but not be limited to, the control strategies and methods for implementation that are listed below. If any of the following strategies are determined by the District to not be feasible, an explanation as to why the specific strategy is not feasible shall be included in the Nighttime Noise and Nuisance Reduction Plan.

• Plan construction activities to minimize the amount of construction outside ordinance construction hours or outside the hours of 7 am to 10 pm, where the noise ordinance does not include construction hours.

• Install temporary noise barriers, such as shields and blankets, immediately adjacent to all stationary noise sources operating during evening and nighttime hours (e.g., auger rigs, generators).

• Install temporary noise barriers that block the line of sight between evening construction activities and the closest residences within 1,000 feet.

• Publish and distribute to the potentially affected community within 1,000 feet of pending evening construction activities, a telephone number, which shall be attended during the evening construction working hours, for use by the public to register complaints. All complaints shall be logged noting date, time, complainants’ name, nature of complaint, and any corrective action taken.
Impact WPF-NOI-2: Construction and operation of the WPF could expose persons to excessive groundborne noise or vibration, a less-than-significant impact with mitigation.

WPF at the WPCP

Vibration impacts of construction activities for the WPF at the WPCP would be similar those discussed under Impact NOI-2 as WPF construction at the WPCP site would involve similar construction activities and equipment (see Table 4.4-7). Attenuated vibration levels at the nearest offsite buildings located approximately 200 feet away from the eastern main plant boundary would be well below the 0.2 in/sec PPV significance threshold. Consequently, construction vibration impacts at residential receptors located more than 4,000 feet away would also be less than significant.

Operation of the WPF at the WPCP would not include equipment that could generate vibrations greater than those generated during construction; therefore, the level of exposure of persons to vibration during WPF operation at the WPCP would be less than significant.

Pipelines and Injection Wells

Vibration impacts from construction activities associated with the Groundwater Replenishment Facilities of the WPF would be more pronounced when construction of pipelines and injection wells takes place in the vicinity of sensitive receptors. The effects of construction of pipelines and injection wells on historic buildings are discussed in Section 4.14, Cultural Resources, Impact WPF-CUL-1. The locations of pipeline alignments and injection wells currently are not known. Use of construction equipment such as drilling rigs, pavement saws, jackhammers, and vibratory compactors would generate noticeable vibration levels that could affect sensitive receptors if they are located in the immediate vicinity (within 50 feet of construction activity). Implementation of Mitigation Measures WPF-NOI-1a (Construction Noise Logistics Plan), WPF-NOI-1b (Noise and Vibration Reduction Plan for Construction of Pipelines and Injection Wells) and WPF-NOI-1c (Nighttime Noise and Nuisance Reduction Plan) would reduce vibration impacts in addition to reducing construction noise. With mitigation, the temporary vibration impact would be reduced to a less-than-significant level.

Operation and maintenance of the injection wells could include the use of pumps at the well injection sites to move water from the pipelines into the groundwater. Operation of the pumps would not introduce any new sources of perceivable groundborne vibration to the injection well areas. Therefore, there would be no operation-related vibration impacts.
4. Environmental Setting, Impacts, and Mitigation Measures

4.4 Noise and Vibration

Mitigation Measures

Implement Mitigation Measures WPF-NOI-1a (Construction Noise Logistics Plan), WPF-NOI-1b (Noise and Vibration Reduction Plan for Construction of Pipelines and Injection Wells), and WPF-NOI-1c (Nighttime Noise and Nuisance Reduction Plan).

Conclusion: Less than Significant with Mitigation.

Impact WPF-NOI-3: Operation of the WPF facilities could result in a permanent increase in noise levels above existing ambient noise levels, a less-than-significant impact with mitigation.

WPF at the WPCP

Upon buildout, components of the WPF at the WPCP would not introduce any significant, new sources of noise. As discussed under Impact NOI-3, the main operational noise sources would be the operation of two newly installed 800 kW power generation engines in the power generation facility and a second 2,500 kW standby diesel generator. Equipment such as blowers in aeration basins and pumps used to convey the effluent between primary, secondary, and tertiary treatment processes would also contribute to operational noise.

At 4,200 feet, the approximate distance from the WPCP’s southern boundary to the nearest residences, combined noise levels from the simultaneous operation of the power generation engines, pumps, and blowers would attenuate to below existing ambient noise levels at these residences. Much of this equipment would replace existing equipment and would be housed within enclosures that would provide additional noise attenuation. In addition, physical barriers such as intervening buildings and the landfill south of Carl Road would block the line of sight between the source and receptors and provide additional attenuation. The resulting noise levels would not exceed the ambient noise level at the nearest residences by greater than 5 dBA. The impact would be less than significant.

Pipelines and Injection Wells

Operation of the injection wells could produce some noise from injection well pumps. Transformers to supply power to the pumps may also generate noise during operation. Multiple factors determine the potential impact of the injection well equipment, including the size/capacity of the pumps and transformers, whether they are enclosed, the distance between the injection wells and sensitive receptors, and the locations of any enclosure openings relative to sensitive receptors. As noted above, wells could be located in San José, Campbell, or Saratoga (see Figure 4.2-1).

Without adequate design, injection wells could generate noise above local ordinance requirements or in excess of existing ambient noise levels (as determined by host jurisdiction general plan criteria), a potentially significant impact. With implementation of Mitigation Measure WPF-NOI-3, Injection Well Siting and Design, however, the residual impact would be less-than-significant.
Mitigation Measures

Mitigation Measure WPF-NOI-3: Injection Well Siting and Design

Pumps and engines at the injection well locations shall be sited and designed such that land use compatibility standards of the applicable jurisdictions are met. During siting of injection wells, the District shall determine the potential increase in L_{dn} generated by the injection wells. Siting and design measures to achieve the land use compatibility standards include:

- Siting wells where the increase in L_{dn} at the nearest sensitive receptors would be within the new development compatibility standards in the general plans of the host jurisdictions.
- Enclosing the injection wells and any associated equipment within buildings.
- Designing injection well enclosures such that openings are directed away from sensitive receptors.

Conclusion: Less than Significant with Mitigation.

4.4.5 References


City of San José. Envision San José 2040 General Plan. Adopted November 1, 2011.


4. Environmental Setting, Impacts, and Mitigation Measures

4.4 Noise and Vibration


4.5 Air Quality

This section describes and evaluates issues related to air quality in the context of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan and Water Purification Facilities (WPF). Discussed are: an introduction to criteria air pollutants and toxic air contaminants; the physical and regulatory setting; the baseline for determining environmental impacts; the criteria used for determining the significance of environmental impacts; and potential impacts and appropriate mitigation measures associated with implementation of the Master Plan or WPF.

4.5.1 Fundamentals of Air Quality

4.5.1.1 Criteria Air Pollutants

The U.S. Environmental Protection Agency (U.S. EPA) has identified criteria air pollutants that are a threat to public health and welfare. These pollutants are called “criteria” air pollutants because standards have been established for each of them to meet specific public health and welfare criteria (see Section 4.5.3, Regulatory Setting, below). The following criteria pollutants are a concern in the study area.

**Ozone**

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOX). ROG and NOX are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately 3 hours.

Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NOX under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds like ozone.

**Nitrogen Dioxide**

Nitrogen dioxide (NO2) is an air quality pollutant of concern because it acts as a respiratory irritant. NO2 is a major component of the group of gaseous nitrogen compounds commonly referred to as NOx. A precursor to ozone formation, NOx is produced by fuel combustion in motor vehicles, industrial stationary sources (such as refineries, power plants, and chemical manufacturing facilities), ships, aircraft, and rail transit. Typically, NOx emitted from fuel combustion is in the form of nitric oxide (NO) and NO2, with the vast majority (95 percent) of the NOx emissions being comprised of NO. NO is converted to NO2 in the atmosphere when it reacts with ozone or undergoes photochemical reactions.
Carbon Monoxide

Carbon monoxide (CO) is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Particulate Matter

Particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter (PM_{2.5}) represent fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. According to a study prepared by the California Air Resources Board (CARB), exposure to ambient PM_{2.5}, particularly diesel particulate matter (DPM), can be associated with approximately 14,000 to 24,000 premature annual deaths statewide (CARB, 2009). Particulate matter also can damage materials and reduce visibility.

4.5.1.2 Toxic Air Contaminants

Toxic air contaminants (TACs) are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including DPM emissions from diesel-fueled engines which were identified as a TAC by CARB in 1998 (CARB, 2015a).

4.5.2 Setting

4.5.2.1 Regional Topography, Meteorology, and Climate

The potential for high pollutant concentrations developing at a given location depends upon the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the contaminated air. The atmospheric pollution potential,
as the term is used here, is independent of the location of emission sources and is instead a function of factors such as topography and meteorology.

The climate of the greater San Francisco Bay Area, including Santa Clara County, is a Mediterranean-type climate characterized by warm, dry summers and mild, wet winters. The climate is determined largely by a high-pressure system that is often present over the eastern Pacific Ocean off the West Coast of North America. In winter, the Pacific high-pressure system shifts southward, allowing storms to pass through the region. During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate and air pollution potential is very low. During winter periods when the Pacific high becomes dominant, inversions become strong and often are surface-based; winds are light and pollution potential is high. These periods are characterized by winds that flow out of the Central Valley into the Bay Area and often include tule fog (BAAQMD, 2015a).

The air pollution potential is lowest for those regions closest to the San Francisco Bay, due largely to good ventilation and less influx of pollutants from upwind sources. The occurrence of light winds in the evenings and early mornings occasionally results in elevated pollutant levels. Wind flow patterns are controlled by air circulation in the atmosphere, which is affected by air pressure and the variable topography of the coastal areas adjacent to the San Francisco Bay.

The Master Plan area is located in the Santa Clara Valley bounded by the Bay to the north and by mountains to the east, south and west. Temperatures are warm on summer days and cool on summer nights, and winter temperatures are fairly mild. At the northern end of the valley, near the WPCP, mean maximum temperatures are in the low-80's during the summer and the high-50's during the winter, and mean minimum temperatures range from the high-50's in the summer to the low-40's in the winter. Further inland, where the moderating effect of the Bay is not as strong, temperature extremes are greater. Winds in the valley are greatly influenced by the terrain, resulting in a prevailing flow that roughly parallels the valley’s northwest-southeast axis. A north-northwesterly sea breeze flows through the valley during the afternoon and early evening, and a light south-southeasterly drainage flow occurs during the late evening and early morning. In the summer the southern end of the valley sometimes becomes a “convergence zone,” when air flowing from the Monterey Bay gets channeled northward into the southern end of the valley and meets with the prevailing northwesterly winds. Wind speeds are greatest in the spring and summer and weakest in the fall and winter. Nighttime and early morning hours frequently have calm winds in all seasons, while summer afternoons and evenings are quite breezy. Strong winds are rare, associated mostly with the occasional winter storm.

The air pollution potential of the Santa Clara Valley is high. High summer temperatures, stable air, and mountains surrounding the valley combine to promote ozone formation. In addition to the many local sources of pollution, ozone precursors from San Francisco, San Mateo and Alameda Counties are carried by prevailing winds to the Santa Clara Valley. The valley tends to channel pollutants to the southeast. In addition, on summer days with low level inversions, ozone can be recirculated by southerly drainage flows in the late evening and early morning and by the prevailing northwesterlies in the afternoon. A similar recirculation pattern occurs in the winter, affecting levels of carbon monoxide and particulate matter. This movement of the air up and down
the valley increases the impact of the pollutants significantly. Pollution sources are plentiful and complex in this subregion. The Santa Clara Valley has a high concentration of industry at the northern end, in the Silicon Valley. Some of these industries are sources of air toxics as well as criteria air pollutants. In addition, Santa Clara Valley’s large population and many work-site destinations generate the highest mobile source emissions of any subregion in the San Francisco Air Basin.

4.5.2.2 Existing Air Quality

The Bay Area Air Quality Management District (BAAQMD) operates a regional monitoring network of air quality monitoring stations to measure the ambient concentrations of criteria pollutants. Existing levels of air pollutants in the study area can be inferred from ambient air quality measurements conducted by BAAQMD at its closest station to the project area. There are no monitoring stations located within Sunnyvale. The closest air quality monitoring stations is the Jackson Street monitoring station located in San José, approximately seven miles southeast of the WPCP. Table 4.5-1 shows a five-year (2010 through 2014) summary of data monitored at this station. The table also compares the data to the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

As shown in Table 4.5-1, the state 1-hour ozone standard was exceeded seven times between 2010 and 2012; and the state and national 8-hour ozone standards were exceeded three times in 2010 and once in 2013. The 24-hour state PM\textsubscript{10} standard was exceeded seven times between 2012 and 2014 with five of those exceedances in 2013; and the annual average state PM\textsubscript{10} standard was exceeded once during the 5-year study period, also in 2013. There were no exceedances of the 24-hour federal PM\textsubscript{10} standard during the 5-year study period. The national 24-hour PM\textsubscript{2.5} standard was exceeded between two and four times each year between 2010 and 2014. There were no measured exceedances of the annual average state or national PM\textsubscript{2.5} standards, the NO\textsubscript{2} state standard, or the CO state standard during the 5-year study period.

4.5.2.3 Sensitive Receptors

For the purposes of air quality analysis, sensitive receptors are defined as land uses and facilities that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals, and daycare centers. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, and/or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, which results in greater exposure to ambient air quality.

There are no sensitive receptors (e.g., residences, schools) in the immediate vicinity of the WPCP. The WPCP site is surrounded mostly by industrial and office uses. However, there are recreational uses in the vicinity of the project area such as a section of the Bay Trail as well as the
### TABLE 4.5-1
AIR QUALITY DATA SUMMARY (2010–2014) FOR THE MASTER PLAN AND WPF AREAS

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Monitoring Data by Year</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2010</td>
</tr>
<tr>
<td><strong>Ozone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest 1-Hour Average (ppm)</td>
<td>0.09 ppm</td>
<td>0.126</td>
</tr>
<tr>
<td>Days over State Standard</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Highest 8-Hour Average (ppm)</td>
<td>0.07 ppm</td>
<td>0.086</td>
</tr>
<tr>
<td>Days over State Standard</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Days over National Standard</td>
<td></td>
<td>0.075 ppm</td>
</tr>
<tr>
<td><strong>Respirable Particulate Matter (PM&lt;sub&gt;10&lt;/sub&gt;)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest 24-Hour Average (µg/m³)</td>
<td>50 µg/m³</td>
<td>46.8</td>
</tr>
<tr>
<td>Measured Days over State Standard</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Days over National Standard</td>
<td></td>
<td>150 µg/m³</td>
</tr>
<tr>
<td>State Annual Average (µg/m³)</td>
<td>20 µg/m³</td>
<td>19.5</td>
</tr>
<tr>
<td><strong>Fine Particulate Matter (PM&lt;sub&gt;2.5&lt;/sub&gt;)</strong></td>
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<td></td>
</tr>
<tr>
<td>Highest 24-Hour Average (µg/m³)</td>
<td>35 µg/m³</td>
<td>51.5</td>
</tr>
<tr>
<td>Measured Days over National Standard</td>
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<tr>
<td>State Annual Average (µg/m³)</td>
<td>12 µg/m³</td>
<td>9.0</td>
</tr>
<tr>
<td>National Annual Average (µg/m³)</td>
<td>12.0 µg/m³</td>
<td>9.8</td>
</tr>
<tr>
<td><strong>Nitrogen Dioxide (NO&lt;sub&gt;2&lt;/sub&gt;)</strong></td>
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<tr>
<td>Highest Hourly Average (ppm)</td>
<td>0.18 ppm</td>
<td>0.064</td>
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<tr>
<td>Measured Days over State Standard</td>
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<td><strong>Carbon Monoxide (CO)</strong></td>
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<tr>
<td>Highest 8-Hour Average (ppm)</td>
<td>9.0 ppm</td>
<td>2.19</td>
</tr>
<tr>
<td>Measured Days over State Standard</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

**NOTES:** -- indicates that data are not available. Measurements are from the Jackson Street Boulevard Monitoring Station in San José.

ppm = Parts per million
µg/m³ = Micrograms per cubic meter

**SOURCE:** CARB, 2015b.

Baylands Park, located less than a mile to the east of the site. The nearest residential uses are the single family homes located immediately to the south of State Route (SR) 237, which are at least 0.8 mile from the Master Plan area. There are no hospitals, daycare centers, or long-term care facilities within 0.5 mile of the Master Plan area.

The locations of the offsite components of the WPF (such as pipelines, recharge basins and injection wells) have not been identified yet. These would be located south of the WPCP within the cities of Sunnyvale, San José, Santa Clara, Saratoga, Cupertino and Campbell. Depending on the locations chosen, sensitive receptors could be present in their vicinity.
4.5.2.4 Baseline Conditions

**Existing Sources of Air Emissions**

Existing stationary sources of criteria pollutants and TACs at the WPCP include sources such as gas powered internal combustion cogeneration engines, gas boilers, diesel internal combustion engines, wastewater fugitive emissions, diesel pumps, diesel compressors, digester gas flares, and a gasoline storage facility.

**Existing Sources of Odors**

Wastewater treatment plants are often a major source of odors. Odorous emissions from the WPCP can be a nuisance and source of discomfort to employees, operators, and visitors to the site.

The Sunnyvale WPCP and the Sunnyvale Materials Recovery and Transfer Station (SMaRT Station®) abutting the main plant to the east generate odors during the processing of large volumes of municipal organic wastes in an open-air environment. At the WPCP, odors primarily emanate from the Preliminary Treatment and biosolids processes. A facility’s tendency to generate odors can be gauged by the number of odor complaints against the facility filed with the BAAQMD. Every complaint is investigated individually by a BAAQMD field inspector. During regular business hours, complaints are typically assigned to an investigator within 30 minutes. Inspectors proceed directly to the area of the suspected source to determine the cause of the odor, and when possible they confirm odor complaints in the presence of the complainant. The BAAQMD has received just one confirmed odor complaint and five unconfirmed complaints regarding odor at the WPCP over the 6-year period from 2009 through 2014 (BAAQMD, 2015b). There were no odor violation notices issued for the WPCP by the BAAQMD during the 6-year period.

4.5.3 Regulatory Setting

Established federal, state, and regional regulations provide the framework for analyzing and controlling air pollutant emissions and thus general air quality. The U.S. EPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal ambient air quality standards and reviewing state implementation plans, described further below. However, the U.S. EPA has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented. In California, the CARB is responsible for establishing and reviewing the state ambient air quality standards, developing and managing the California State Implementation Plan, securing approval of this plan from the U.S. EPA, and identifying TACs. CARB also regulates mobile emissions sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. An air quality management district is primarily responsible for regulating stationary emission sources at facilities within its geographic areas and for preparing the air quality plans that are required under the federal Clean Air Act and 1988 California Clean Air Act. The BAAQMD is the regional agency with regulatory authority over emission sources in the nine-county San Francisco Bay Area.
4.5 Air Quality

The regulatory settings for the following classes of air pollutants are discussed below: criteria pollutants, odiferous compounds, and TACs.

### 4.5.3.1 Federal and State Regulations

Regulation of criteria air pollutants is achieved through both national and state ambient air quality standards and emissions limits for individual sources. Regulations implementing the federal Clean Air Act and its subsequent amendments established national ambient air quality standards for six criteria pollutants: ozone, NO₂, SO₂, PM₁₀, PM₂.₅, and lead. California has adopted more stringent state ambient air quality standards for most of the criteria air pollutants. In addition, California has established state ambient air quality standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Because of the unique meteorological conditions in the state, state standards in California are generally more stringent than federal standards, as shown in Table 4.5-2.

The ambient air quality standards are intended to protect public health and welfare, and they incorporate a margin of safety. The standards are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including people with asthma, the very young, elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

**Attainment Status**

Under amendments to the federal Clean Air Act, the U.S. EPA has classified air basins or portions thereof as either “attainment” or “non-attainment” for each criteria air pollutant, based on whether or not the national standards have been achieved. The California Clean Air Act, which is patterned after the federal Clean Air Act, also requires areas to be designated as “attainment” or “non-attainment” for the state standards. Thus, areas in California have two sets of attainment/non-attainment designations: one set with respect to the national standards and one set with respect to the state standards. Table 4.5-2 shows the attainment status of the San Francisco Air Basin with respect to the national and state ambient air quality standards for different criteria pollutants.

**Federal Regulations**

The U.S. EPA is responsible for implementing programs established by the federal Clean Air Act, such as establishing and reviewing the NAAQS for the following air pollutants: CO, ozone, NO₂, SO₂, PM₁₀, PM₂.₅, and lead. The federal Clean Air Act also requires the U.S. EPA to designate areas (counties or air basins) as attainment or non-attainment with respect to each criteria pollutant, depending on whether the area meets the NAAQS. If an area is designated as non-attainment, it does not meet the NAAQS and is required to create and maintain a state implementation plan for achieving compliance with the NAAQS. Conformity to the state implementation plans is defined under the 1990 Clean Air Act amendments as conformity with the plan’s purpose in eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of these standards. Air quality within the San Francisco Air Basin does not attain the federal standards for ozone or PM₂.₅.
### TABLE 4.5-2
**AMBIENT AIR QUALITY STANDARDS AND SAN FRANCISCO AIR BASIN ATTAINMENT STATUS**

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Ozone</strong></td>
<td>8 Hour</td>
<td>0.070 ppm</td>
<td>Non-Attainment</td>
<td>0.075 ppm</td>
<td>Non-Attainment</td>
</tr>
<tr>
<td></td>
<td>1 Hour</td>
<td>0.09 ppm</td>
<td>Non-Attainment</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Carbon Monoxide</strong></td>
<td>8 Hour</td>
<td>9.0 ppm</td>
<td>Attainment</td>
<td>9 ppm</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td>1 Hour</td>
<td>20 ppm</td>
<td>Attainment</td>
<td>35 ppm</td>
<td>Attainment</td>
</tr>
<tr>
<td><strong>Nitrogen Dioxide</strong></td>
<td>Annual Average</td>
<td>0.030 ppm</td>
<td>---</td>
<td>0.053 ppm</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td>1 Hour</td>
<td>0.18 ppm</td>
<td>Attainment</td>
<td>0.100 ppm</td>
<td>Unclassified</td>
</tr>
<tr>
<td><strong>Sulfur Dioxide</strong></td>
<td>Annual Average</td>
<td>---</td>
<td>---</td>
<td>0.030 ppm</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td>24 Hour</td>
<td>0.04 ppm</td>
<td>Attainment</td>
<td>0.14 ppm</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td>1 Hour</td>
<td>0.25 ppm</td>
<td>Attainment</td>
<td>0.075 ppm</td>
<td>Attainment</td>
</tr>
<tr>
<td><strong>Respirable Particulate Matter</strong></td>
<td>Annual Arithmetic Mean</td>
<td>20 µg/m³</td>
<td>Non-Attainment</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Fine Particulate Matter</strong></td>
<td>24 Hour</td>
<td>50 µg/m³</td>
<td>Non-Attainment</td>
<td>150 µg/m³</td>
<td>Unclassified</td>
</tr>
<tr>
<td><strong>Sulfates</strong></td>
<td>24 Hour</td>
<td>25 µg/m³</td>
<td>Attainment</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Lead</strong></td>
<td>Calendar Quarter</td>
<td>---</td>
<td>---</td>
<td>1.5 µg/m³</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td>30-Day Average</td>
<td>1.5 µg/m³</td>
<td>Attainment</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>3-Month Rolling Average</td>
<td>---</td>
<td>---</td>
<td>0.15 µg/m³</td>
<td>Unclassified</td>
</tr>
<tr>
<td><strong>Hydrogen Sulfide</strong></td>
<td>1 Hour</td>
<td>0.03 ppm</td>
<td>Unclassified</td>
<td>No Federal Standard</td>
<td>---</td>
</tr>
<tr>
<td><strong>Vinyl Chloride</strong></td>
<td>24 Hour</td>
<td>0.010 ppm</td>
<td>No information available</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Visibility Reducing Particles</strong></td>
<td>8 Hour</td>
<td>Extinction of 0.23/km; visibility of 10 miles or more</td>
<td>Unclassified</td>
<td>No Federal Standard</td>
<td>---</td>
</tr>
</tbody>
</table>

ppm = parts per million
µg/m³ = micrograms per cubic meter

SOURCE: BAAQMD, 2015c
State Regulations

CARB is the agency delegated responsibility for preparing and submitting the state implementation plan to the U.S. EPA. CARB also oversees air quality policies in California and has established CAAQS for NO2, CO, PM10, PM2.5, SO2, ozone, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. The CAAQS tend to be at least as stringent (and typically more stringent) than the NAAQS.

The California Clean Air Act was approved in 1988 and requires each local air district in the state to prepare an air quality plan to achieve compliance with the CAAQS. Similar to the U.S. EPA, the CARB designates counties or air basins in California as attainment or non-attainment with respect to the CAAQS. Air quality within the San Francisco Air Basin does not attain the state standards for ozone, PM10, or PM2.5.

4.5.3.2 Bay Area Air Quality Management District

The Master Plan and WPF areas are within the jurisdiction of the BAAQMD, the local agency delegated responsibility for preparing, adopting, and implementing stationary and area air emission control measures and standards.

BAAQMD Air Quality Plans

The 1977 Clean Air Act amendments require regional planning and air pollution control agencies to prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the Clean Air Act. The California Clean Air Act also requires development of air quality plans and strategies to meet state air quality standards in areas designated as non-attainment (with the exception of areas designated as non-attainment for the state PM standards). Maintenance plans are required for attainment areas that had previously been designated non-attainment in order to ensure continued attainment of the standards. (As indicated above, air quality plans developed to meet federal requirements are referred to as state implementation plans.)

For state air quality planning purposes, the San Francisco Air Basin is classified as a serious non-attainment area for the 1-hour ozone standard. The “serious” classification triggers various plan submittal requirements and transportation performance standards. One such requirement is that the BAAQMD update the Clean Air Plan every three years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data. The Bay Area’s record of progress in implementing previous measures must also be reviewed. The plans for the San Francisco Air Basin are prepared with the cooperation of the Metropolitan Transportation Commission and the Association of Bay Area Governments. On September 15, 2010, the BAAQMD adopted the most recent revision to the Clean Air Plan - the Bay Area 2010 Clean Air Plan (2010 CAP). The 2010 CAP serves to:

- Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement “all feasible measures” to reduce ozone;
4. Environmental Setting, Impacts, and Mitigation Measures

4.5 Air Quality

- Consider the impacts of ozone control measures on particulate matter, air toxics, and greenhouse gases in a single, integrated plan;
- Review progress in improving air quality in recent years; and
- Establish emission control measures to be adopted or implemented in the 2010 – 2012 timeframe (BAAQMD, 2010).

Under the California Clean Air Act, the BAAQMD is required to develop an air quality attainment plan for criteria pollutants that are designated as non-attainment within the air district. Several project components may be subject to BAAQMD rules and regulations governing criteria pollutants, toxic air contaminants, and odorous compounds even though permits may not be required. Stationary sources, such as generators, are required to have permits from the BAAQMD before constructing, changing, or operating the source. If the BAAQMD determines that the project would be subject to its permit requirements, it could issue two permits for the project, an Authority to Construct and a Permit to Operate. The project may also participate in the BAAQMD’s Equipment Registration program.

**Authority to Construct**

The BAAQMD requires any person or facility that puts in place, builds, erects, installs, modifies, modernizes, alters, or replaces any article, machine, equipment, or other contrivance, the use of which may cause, reduce, or control the emission of air contaminants, to obtain written authorization from the BAAQMD in the form of an Authority to Construct permit (unless the source is specifically excluded or exempt from permit requirements). The BAAQMD’s permit process is a pre-construction review and approval process. The BAAQMD’s review is conducted after the equipment is designed, but before it is installed.

**Permit to Operate**

After an Authority to Construct permit has been issued and construction is complete, a Permit to Operate is required to verify that the permitted equipment performs as required. The Permit to Operate must be renewed annually.

**Equipment Registration**

The BAAQMD operates a registration process program for the several types of equipment potentially being used at the WPCP, including industrial boilers, engine generators, and process heaters. The registration process allows for these types of equipment to operate without a Permit to Operate, provided the equipment meets the published regulatory criteria. These registrations must be renewed periodically on a schedule set forth by the BAAQMD.

**Odors**

The BAAQMD is responsible for investigating odor complaints in the area. Upon receipt of a complaint, BAAQMD sends an investigator to interview the complainant and to locate the odor source if possible. BAAQMD Regulation 1, Rule 301 is the nuisance provision that states sources cannot emit air contaminants that cause nuisance to a considerable number of persons or the
public. BAAQMD enforces odor control by helping the public document a public nuisance. BAAQMD typically brings a public nuisance court action when there are a significant number of confirmed odor events within a 24-hour period. A finding of public nuisance is punishable by fine. California Health and Safety Code Section 41700 prohibits emissions that cause odors, health problems, property damage, or other nuisance.

### 4.5.3.3 Local Policies

**City of Sunnyvale General Plan**

The Environmental Management chapter of the Sunnyvale General Plan contains several policies that help towards achieving the General Plan’s goal of improving the air quality of Sunnyvale and reducing the exposure of its citizens to air pollutants (City of Sunnyvale, 2011). The General Plan policies related to air quality call for greater City participation in regional air quality planning efforts, use of better land use strategies to reduce generation and exposure to pollutants, and a reduction of transportation related emissions through better congestion management and provision of alternative modes of transportation. Specifically, the following policies apply to the project:

- **Policy EM-11.3** Require all new development to utilize site planning to protect citizens from unnecessary exposure to air pollutants.

- **Policy EM-11.7**. Reduce emissions from City of Sunnyvale fleet vehicles.

### 4.5.4 Impacts and Mitigation Measures

#### 4.5.4.1 Thresholds of Significance

For the purposes of this PEIR, an impact related to air quality is considered significant if implementation of the proposed project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The analysis presented below uses the methodologies provided in the BAAQMD’s *CEQA Air Quality Guidelines* updated in 2011 (BAAQMD, 2011); herein referred to as the BAAQMD Guidelines. The BAAQMD’s adoption of the significance thresholds in the BAAQMD Guidelines was rescinded by a legal decision that found that proper CEQA review of the thresholds did not occur, then the California Court of Appeal reversed the decision and the California Supreme Court
granted review of the case; however, only to address whether or not CEQA requires an analysis of how existing environmental conditions will impact future residents or users of a proposed project. On December 17, 2015, the Supreme Court concluded that agencies subject to CEQA generally are not required to analyze the impact of existing environmental conditions on a project’s future users or residents, reversing the Court of Appeal’s judgment on that issue. As of January 11, 2016, the BAAQMD has not yet released a formal response to the Supreme Court’s Decision, and has not reversed its interim position that it no longer recommends that its thresholds identified in its Air Quality Guidelines (2011) be used as a “generally applicable measure” of a project’s significant air quality impacts. However, the City has determined that Appendix D of the BAAQMD Guidelines, in combination with BAAQMD’s Revised Draft Options and Justification Report (BAAQMD, 2009), provides substantial evidence to support the 2011 thresholds and, therefore, has determined they are appropriate for use in this analysis. Below are the specific thresholds that are used to determine the significance of the air quality impacts that would be associated with the proposed project.

**Air Quality Plans**

BAAQMD recommends that the agency approving a project where an air quality plan consistency determination is required analyze the project with respect to the following questions: (1) does the project support the primary goals of the air quality plan; (2) does the project include applicable control measures from the air quality plan; and (3) does the project disrupt or hinder implementation of any 2010 CAP control measures? If the first two questions are concluded in the affirmative, and the third question concluded in the negative, the BAAQMD considers the project consistent with air quality plans prepared for the San Francisco Air Basin.

Any project that would not support the 2010 CAP goals would not be considered consistent with the 2010 CAP. The recommended measure for determining project support of these goals is consistency with CEQA thresholds of significance. If the CEQA thresholds of significance are exceeded, then the project would not be considered to support the 2010 CAP goals and the associated impact would be significant.

**Criteria Pollutants**

Impacts related to the project contributing to an existing or projected air quality violation and whether the project would result in a cumulatively considerable net increase of any criteria pollutant or associated precursors are judged by comparing estimated direct and indirect project exhaust emissions to the significance thresholds, which for short-term construction emissions are 54 pounds per day for ROG, NOX, and PM2.5; and 82 pounds per day for PM10. Only the exhaust portion of PM2.5 and PM10 emissions are compared against the construction thresholds. The BAAQMD recommends that analyses focus on implementation of dust control measures rather than comparing estimated levels of fugitive dust to a quantitative significance threshold. Rather, the BAAQMD considers implementation of the BAAQMD-recommended mitigation measures for fugitive dust sufficient to ensure that construction-related fugitive dust is reduced to a less-than-significant level. For long-term operations, BAAQMD has two sets of significance thresholds, including daily thresholds that are the same as the construction thresholds, and annual thresholds that are 10 tons per year for ROG, NOX, and PM2.5; and 15 tons per year for PM10.
Community Health Risk

According to BAAQMD, the project would have a significant air quality impact if the construction or operation phase would expose persons to substantial levels of TACs, such that the probability of contracting cancer exceeds 10 in one million, or if it would expose persons to pollutants such that a chronic and/or acute non-cancer Hazard Index of 1.0 would be exceeded. In addition, a significant impact would occur if construction or operation of the project would result in an incremental increase in annual average ambient concentrations of PM$_{2.5}$ of more than 0.3 µg/m$^3$. The project would have a significant cumulative health risk impact if the combined cancer risk associated with all local permitted stationary sources and major roadways plus the risks associated with the project at the maximally exposed receptor exceeds 100 in one million, results in a non-cancer Hazard Index that exceeds 10, or results in incremental increase in annual average PM$_{2.5}$ concentrations that exceed 0.8 µg/m$^3$.

Odors

Impacts related to objectionable odors are evaluated based on the potential for the project to generate odors that could affect nearby sensitive receptors in a manner that would cause frequent complaints. BAAQMD considers five or more confirmed odor complaints per year averaged over three years as an indication of a significant odor impact from a facility.

4.5.4.2 Approach to Analysis

The analysis included below is a program-level analysis of the air quality impacts associated with the proposed Master Plan improvements and the WPF. The City would undertake further environmental review pursuant to CEQA when a determination is made to implement a WPCP or WPF improvement evaluated in the PEIR and when conceptual design is completed and construction details developed. Emissions in the analysis provided below have been quantified to the extent possible using available data and the methods described below.

Construction Emissions

Information available on construction of Master Plan improvements includes the type of construction activities, equipment to be used, and overall phasing (see Section 3.4.8 in Chapter 3, Project Description). Other details typically used to calculate air pollutant emissions (including the number of pieces of each type of off- and on-road equipment and daily equipment usage rates in terms of hours per day and total days of use) will not be available for some time. However, the type of construction activities and equipment to be used for proposed improvements at the WPCP would be similar to those identified for the City of Sunnyvale Primary Treatment Facility Project, to be constructed at the main plant beginning in 2016 (City of Sunnyvale, 2014). Detailed air pollutant emissions were calculated for the three construction phases of the Primary Treatment Facility Project, and were used to estimate the relative magnitude of daily air

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1 The detailed emissions estimates prepared for the Primary Treatment Facility project are presented in the Sunnyvale Water Pollution Control Plant Primary Treatment Facility Project Initial Study/Mitigated Negative Declaration (SCH Number 2014112037), available at City of Sunnyvale Department of Public Works, 456 West Olive Avenue, Sunnyvale CA 94086). Approved in May 2015.
pollutant emissions for similar activities proposed at the WPCP under the Master Plan and the WPF. Phase 1 of the Primary Treatment Facility Project would involve earthwork activities such as site preparation, excavation, import of infill material, and off-hauling of surcharge; Phase 2 of the Primary Treatment Facility Project would include laying foundations, concrete work, backfilling and paving; and Phase 3 would involve activities associated with demolition and site restoration. Emissions estimates were prepared for each of these phases based on detailed and project- and phase-specific construction-related assumptions, such as the number and type of pieces of off-road construction equipment to be used; number of on-road vehicle trips (for construction workers and haul trucks); and daily equipment usage rates in terms of hours per day and total days. With input from Carollo Engineers, the Master Plan improvements and WPF were associated with comparable phases (in terms of construction intensity) of Primary Treatment Facility Project construction. Note that this approach was not used for the following Master Plan improvements that lie outside the main plant: 1A – Existing WPCP Rehabilitation, 4A – Split Flow Conventional Activated Sludge Expansion (Diurnal Equalization) and 5A (Decommissioning of Ponds 1 and 2). The scale of construction involved in these improvements is not sufficiently understood at this time. Similarly, emissions were not estimated for improvements outside the main plant under the WPF or for WPF pipelines and injection wells due to lack of information.

When project-level CEQA review of Master Plan improvements is initiated, the City will review this analysis in light of updated construction information and revise the analyses accordingly.

Operation Emissions

Motor Vehicle Emissions

Operational emissions that would be associated with employee commuters, material hauling, and deliveries were estimated using the EMFAC2014 emission factors for light-duty gasoline-fueled trucks (LDT1) and heavy-duty diesel-fueled trucks (T7) multiplied by the increase in estimated long-term operation and maintenance-related employee vehicle and material haul truck miles travelled per year, respectively, for both the Master Plan and the WPF. For a conservative analysis, EMFAC2014 vehicle emission factors for calendar year 2017 were used to estimate operation-related vehicle exhaust. The analysis also assumes that each employee vehicle round trip would be 25 miles and each haul trip would be 50 miles.

Combustion Emissions from Onsite Co-Generation Facility

Emissions from natural gas and biogas combustion at the cogeneration facility are estimated using U.S. EPA’s AP-42 emission factors for natural gas, landfill gas, and digester gas fueled engines (U.S. EPA, 2000). Fuel use data for these estimates was provided by Carollo Engineers (Carollo, 2015). Emissions from the standby diesel generator were estimated using U.S. EPA emission factors for large stationary diesel engines greater than 600 hp assuming a maximum of 50 hours of operation for testing and maintenance, as limited by the BAAQMD.
Health Risk

During construction of the Master Plan and the WPF, diesel construction equipment and vehicles would emit TAC emissions in the form of DPM. Once constructed, operation of the proposed Master Plan and the WPF would result in TAC emissions generated from haul trucks, the operation of the proposed 2,500 kW diesel standby generator, and the combustion of blended gas used at the cogeneration facility. Exposure of sensitive receptors to TAC emissions is the primary factor used to determine health risk. The nearest offsite sensitive receptors are separated from the WPCP by a relatively large buffer distance of over 4,000 feet, which would help reduce exposure. The BAAQMD has identified a distance of 1,000 feet from the source to the closest sensitive receptor locations within which community health risk thresholds would be applicable to gauge the significance of health risk-related impacts. Given the relatively long distance from the WPCP to the closest sensitive receptors, the construction and operation health risk analyses included in this section are qualitative discussions of the program-level impacts of the Master Plan improvements and the WPF.

Odors

Proposed improvements and changes in plant operations are used to determine future odor conditions at and around the plant and gage the likelihood that proposed changes could cause frequent complaints.

4.5.4.3 Impact Summary

Table 4.5-3 lists the project’s air quality-related impacts and significance determinations.

<table>
<thead>
<tr>
<th>Impact</th>
<th>Master Plan</th>
<th>Water Purification Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQ-1: Conflict With or Obstruct Air Quality Plan Implementation</td>
<td>SU</td>
<td>SU</td>
</tr>
<tr>
<td>AQ-2: Violate or Contribute to Violation of Any Air Quality Standard During Construction</td>
<td>SU</td>
<td>SU</td>
</tr>
<tr>
<td>AQ-3: Violate or Contribute to Violation of Any Air Quality Standard During Operation</td>
<td>LS</td>
<td>LS</td>
</tr>
<tr>
<td>AQ-4: Exposure of Sensitive Receptors to Substantial Pollutant Concentrations of TACs</td>
<td>LS</td>
<td>LS</td>
</tr>
<tr>
<td>AQ-5: Objectionable Odors</td>
<td>LS</td>
<td>LS</td>
</tr>
</tbody>
</table>

LS = Less than Significant impact, no mitigation required  
SU = Significant and Unavoidable impact, for which feasible mitigation that would reduce the impact to insignificance is not available
4.5.4.4 Master Plan Impacts and Mitigation Measures

Impact AQ-1: Implementation of the Master Plan would generate emissions that would conflict with the 2010 Clean Air Plan, a significant and unavoidable impact.

The most recently adopted air quality plan for the project areas is the 2010 CAP. The 2010 CAP is an update to the BAAQMD’s 2005 Ozone Strategy to comply with state air quality planning requirements. The 2010 CAP also serves as a multi-pollutant air quality plan to protect public health and the climate. The 2010 CAP control strategy includes revised, updated, and new measures in the three traditional control measure categories: stationary source measures, mobile source measures, and transportation control measures. In addition, the 2010 CAP identifies two new categories of control measures: land use and local impact measures and energy and climate measures.

If the Master Plan improvements do not support the goals in the 2010 CAP, the project would not be considered consistent with the 2010 CAP. The recommended measure for determining project support of these goals is consistency with the CEQA thresholds of significance. As discussed under Impact AQ-2, below, emissions associated with construction of the Master Plan would exceed significance thresholds resulting in a significant and unavoidable impact; therefore, construction of the Master Plan would conflict with the primary goals of the 2010 CAP, and the associated impact associated would be significant and unavoidable.

Mitigation: Implement Mitigation Measures AQ-2a (Implement BAAQMD Basic Construction Mitigation Measures) and AQ-2b (Implement BAAQMD Additional Construction Mitigation Measures).

Conclusion: Significant and Unavoidable. Implementation of the BAAQMD’s basic and additional construction mitigation measures listed in Mitigation Measures AQ-2a and AQ-2b would reduce potential impacts primarily from fugitive dust and, to a lesser extent, from exhaust. While these measures would reduce construction impacts from fugitive dust to a less-than-significant level, they are not likely to reduce emissions from construction equipment exhaust to levels below significance. Therefore, even with mitigation, construction of the Master Plan would be inconsistent with the 2010 Clean Air Plan. This impact would be significant and unavoidable.

Impact AQ-2: Construction activities associated with Master Plan improvements would generate emissions that could contribute to air quality violations; with mitigation the impact would be less-than-significant for all improvements except for Stages 1A, 4A, and 5A, which would be significant and unavoidable.

Table 4.5-4 shows the estimated criteria air pollutant construction exhaust emissions for each of the proposed Master Plan improvement stages, as calculated using the methodology discussed above under Approach to Analysis. As shown in the table, all emissions associated with each of the Master Plan improvement stages would be less than the identified significance thresholds, with the
### Table 4.5-4
MASTER PLAN AVERAGE DAILY CONSTRUCTION EXHAUST EMISSIONS

<table>
<thead>
<tr>
<th>Master Plan Construction Stage</th>
<th>ROG</th>
<th>NOₓ</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
<th>Likely to be Significant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A – Existing WPCP Rehabilitation</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>1B – Demolition of Primary Sedimentation Tanks and Relocation of Bay Trail head</td>
<td>2.2</td>
<td>20.1</td>
<td>1.5</td>
<td>1.6</td>
<td>No</td>
</tr>
<tr>
<td>2A – Split Flow Conventional Activated Sludge Milestone 1</td>
<td>0.8</td>
<td>4.4</td>
<td>0.3</td>
<td>0.2</td>
<td>No</td>
</tr>
<tr>
<td>2B – Construction of Administration/Lab building</td>
<td>0.8</td>
<td>3.5</td>
<td>0.2</td>
<td>0.1</td>
<td>No</td>
</tr>
<tr>
<td>2C – Construction of Maintenance Building and Demolition of existing Administration Building</td>
<td>0.1</td>
<td>0.6</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>No</td>
</tr>
<tr>
<td>2D – Maintenance Building</td>
<td>0.3</td>
<td>1.6</td>
<td>0.1</td>
<td>0.1</td>
<td>No</td>
</tr>
<tr>
<td>2E - Split Flow Conventional Activated Sludge Milestone 2</td>
<td>1.8</td>
<td>10.6</td>
<td>0.6</td>
<td>0.6</td>
<td>No</td>
</tr>
<tr>
<td>2F - Split Flow Conventional Activated Sludge Milestone 3 (Thickening &amp; Dewatering)</td>
<td>1.3</td>
<td>5.9</td>
<td>0.3</td>
<td>0.2</td>
<td>No</td>
</tr>
<tr>
<td>3A – Filter Control Building</td>
<td>0.1</td>
<td>0.6</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>No</td>
</tr>
<tr>
<td>3B – Cogeneration Facility</td>
<td>0.6</td>
<td>3.8</td>
<td>0.2</td>
<td>0.2</td>
<td>No</td>
</tr>
<tr>
<td>3C – Food, Oil &amp; Grease (FOG) Facility, Digester 5 &amp; Biosolids Post-processing</td>
<td>0.9</td>
<td>3.9</td>
<td>0.2</td>
<td>0.2</td>
<td>No</td>
</tr>
<tr>
<td>4A - Split Flow Conventional Activated Sludge Expansion (Diurnal Equalization)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>4B – Demolition of Fixed Growth Reactors (FGRs) and Air Flotation Tanks (AFTs)</td>
<td>3.0</td>
<td>28.1</td>
<td>2.2</td>
<td>2.2</td>
<td>No</td>
</tr>
<tr>
<td>4C - Split Flow Conventional Activated Sludge Clarifiers, Ammonia Feed &amp; Backwash Storage</td>
<td>1.0</td>
<td>4.7</td>
<td>0.2</td>
<td>0.2</td>
<td>No</td>
</tr>
<tr>
<td>5A – Decommissioning of Ponds 1 and 2</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>5B - Future Advanced Facilities (Denitrification Filters, Ozone, Microfiltration)</td>
<td>1.2</td>
<td>6.9</td>
<td>0.4</td>
<td>0.4</td>
<td>No</td>
</tr>
<tr>
<td>Significance Thresholds</td>
<td>54</td>
<td>54</td>
<td>82</td>
<td>54</td>
<td>--</td>
</tr>
</tbody>
</table>

NA = Not Available
NOTE: Refer to Appendix B for assumptions and emissions estimate calculations.

Possible exceptions of Stages 1A, 4A, and 5A. As stated above, the scale of construction involved in these improvements is not well understood at this time. Subsequent project-level CEQA review of these improvements when they are proposed for implementation would confirm the accuracy of this determination. Table 4.5-5 shows the combined impact of multiple WPCP improvement stages being implemented simultaneously, as proposed by the City in its implementation schedule for the Master Plan. As shown in the table, combined construction exhaust emissions are also not likely to exceed the identified significance thresholds at any point during the Master Planning Period (to
2035), except for combined stages that include Stages 1A, 4A, or 5A. Therefore, at this program level of analysis, construction exhaust emissions that would be associated with the proposed Master Plan improvements would not likely contribute substantially to air quality violations, with the exception of Stages 1A, 4A and 5A, which would be significant. However, the overall construction schedule is likely to change. As part of project-level CEQA, the City will update estimates of criteria air pollutant emissions as Master Plan improvements near implementation. Updated emissions estimates for specific improvements, as well as any improvements to be constructed concurrently, could differ from those reported herein, in which case mitigation may or may not be warranted.

### TABLE 4.5-5
**COMBINED AVERAGE DAILY CONSTRUCTION EXHAUST EMISSIONS FROM OVERLAPPING MASTER PLAN CONSTRUCTION STAGES**

<table>
<thead>
<tr>
<th>Overlapping Master Plan Construction Stages</th>
<th>Average Daily Emissions (pounds per day)</th>
<th>ROG</th>
<th>NOx</th>
<th>PM\textsubscript{10}</th>
<th>PM\textsubscript{2.5}</th>
<th>Likely to be Significant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A &amp; 1B</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>1A, 1B, 2B &amp; 2E</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>2A, 2B &amp; 2E</td>
<td></td>
<td>3.4</td>
<td>18.5</td>
<td>1.0</td>
<td>1.0</td>
<td>No</td>
</tr>
<tr>
<td>2B &amp; 2E</td>
<td></td>
<td>2.6</td>
<td>14.2</td>
<td>0.8</td>
<td>0.7</td>
<td>No</td>
</tr>
<tr>
<td>2C, 2D &amp; 2E</td>
<td></td>
<td>2.3</td>
<td>12.8</td>
<td>0.7</td>
<td>0.7</td>
<td>No</td>
</tr>
<tr>
<td>2E &amp; 2F</td>
<td></td>
<td>3.1</td>
<td>16.5</td>
<td>0.9</td>
<td>0.8</td>
<td>No</td>
</tr>
<tr>
<td>2F &amp; 3A</td>
<td></td>
<td>1.4</td>
<td>6.5</td>
<td>0.3</td>
<td>0.3</td>
<td>No</td>
</tr>
<tr>
<td>3B &amp; 3C</td>
<td></td>
<td>1.5</td>
<td>7.7</td>
<td>0.4</td>
<td>0.4</td>
<td>No</td>
</tr>
<tr>
<td>4A &amp; 4C</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>4C, 5A &amp; 5B</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>4B &amp; 5B</td>
<td></td>
<td>4.2</td>
<td>35.0</td>
<td>2.5</td>
<td>2.5</td>
<td>No</td>
</tr>
<tr>
<td><strong>Significance Thresholds</strong></td>
<td></td>
<td>54</td>
<td>54</td>
<td>82</td>
<td>54</td>
<td>--</td>
</tr>
</tbody>
</table>

**NOTE:** Refer to Appendix B for assumptions and emissions estimate calculations.

NA = Not Available

In addition to exhaust emissions, emissions of fugitive dust would also be generated by construction activities associated with grading and earth disturbance, travel on paved and unpaved roads, etc. With regard to fugitive dust emissions, the BAAQMD Guidelines focus on implementation of recommended dust control measures rather than a quantitative comparison of estimated emissions to a significance threshold. The BAAQMD Guidelines consider the impact of fugitive dust emissions from construction activities to be less than significant if recommended Basic and Additional Dust Control Measures contained in Mitigation Measures AQ-2a, Implement BAAQMD Basic Construction Mitigation Measures, and AQ-2b, Implement BAAQMD Additional Construction Mitigation Measures, are implemented. For all projects, the BAAQMD recommends the implementation of its Basic Control Mitigation Measures whether or not construction-related exhaust emissions exceed the applicable significance thresholds. For larger
projects with the potential to exceed emissions thresholds, Additional Control Measures are recommended in addition to the Basic Measures. With implementation of these measures the impact of fugitive dust emissions would be less than significant.

Mitigation Measures

Mitigation Measure AQ-2a: Implement BAAQMD Basic Construction Mitigation Measures

The City shall implement the following applicable BAAQMD Basic Construction Mitigation Measures to reduce emissions of fugitive dust and equipment exhaust:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material offsite shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified visible emissions evaluator.
- Post a publicly visible sign with the telephone number and person to contact at the City regarding dust complaints. This person shall respond and take corrective action within 48 hours.

Mitigation Measure AQ-2b: Implement BAAQMD Additional Construction Mitigation Measures

The City shall implement the following applicable BAAQMD Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Thresholds to further reduce emissions of fugitive dust and exhaust:

- All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
• Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.

• Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.

• The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.

• All trucks and equipment, including their tires, shall be washed off prior to leaving the site.

• Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.

• Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.

• Minimizing the idling time of diesel powered construction equipment to two minutes.

• The City shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NOx reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of newer model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

• All construction equipment, diesel trucks, and generators must be equipped with Best Available Control Technology for emission reductions of NOx and PM.

• All contractors must use equipment that meets CARB’s most recent certification standard for off-road heavy duty diesel engines.

Conclusion: Significant and Unavoidable. Emissions for all stages except Stages 1A, 4A, and 5A would be less than significant with mitigation; however, because not enough information is available to estimate construction-related air pollutant emissions that would be associated with Stages 1A, 4A, and 5A, it cannot be substantiated that implementation of Mitigation Measures AQ-2a and AQ-2b would be adequate to reduce the associated impact to a less-than-significant level. Note that emissions at levels exceeding the threshold would only occur intermittently and for short periods during the 20-year construction period.

Impact AQ-3: Operational activities associated with the Master Plan improvements would generate emissions that could contribute to air quality violations, a less-than-significant impact.

Emissions sources associated with the operation of the Master Plan improvements include the two 800 kW internal combustion engines at the cogeneration facility, the proposed standby diesel generator (of up to 2,500 kW), and the increase in vehicular traffic to the WPCP (in the form of
employee trips and material haul truck trips). Operation of the internal combustion engines and the diesel standby generator would be regulated by the BAAQMD and would require permits from the BAAQMD.

The exact specifications for these proposed program-level improvements have not yet been determined and would be subject to project-level environmental impact analysis following project design. Upon implementation of the Master Plan improvements, the increased digester gas production due to the new secondary treatment process and the implementation of the fats, oil, and grease (FOG) receiving program is expected to offset the expected reduction in the availability of landfill gas in the future, as well as eliminate the use of natural gas at the cogeneration facility. However, the total power generated by the cogeneration facility would more or less remain the same as existing conditions. Combustion of biogas produces lower amounts of ROG and NOx but greater particulate matter emissions when compared to combustion of natural gas. Table 4.5-6 below summarizes the emissions associated with the changes in the operation of the cogeneration facility. Emissions were estimated using existing and future cogeneration facility gas demand figures and projections provided by Carollo Engineers, and AP-42 emission factors for natural gas fired, landfill gas fired, and digester gas fired engines (U.S. EPA, 2000). The table also shows the emissions generated from the operation of the emergency standby generator for routine maintenance and testing and the increase in vehicular traffic to the WPCP.

### TABLE 4.5-6
**ANNUAL OPERATIONAL EMISSIONS FROM MASTER PLAN IMPROVEMENTS**

<table>
<thead>
<tr>
<th>Emissions Source</th>
<th>Annual Emissions (tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROG</td>
</tr>
<tr>
<td>Proposed two 800 kW Engines (Uncontrolled)</td>
<td>0.35</td>
</tr>
<tr>
<td>Standby Diesel Generator</td>
<td>0.06</td>
</tr>
<tr>
<td>Offsite Vehicles</td>
<td>0.11</td>
</tr>
<tr>
<td>Total</td>
<td>0.51</td>
</tr>
<tr>
<td>Significance Thresholds</td>
<td>10</td>
</tr>
<tr>
<td>Significant Impact?</td>
<td>No</td>
</tr>
<tr>
<td>Existing engines</td>
<td>0.44</td>
</tr>
<tr>
<td>Net change in Emissions</td>
<td>0.08</td>
</tr>
<tr>
<td>Significance Thresholds</td>
<td>10</td>
</tr>
<tr>
<td>Significant Impact?</td>
<td>No</td>
</tr>
</tbody>
</table>

NOTE: Refer to Appendix B for the emissions estimate calculations.

The 2,500 kW standby diesel generator was assumed to operate for a maximum of 50 hours per year for testing and maintenance purposes, as limited by the BAAQMD. As stated earlier, there would be no increase in the number of employees at the WPCP site due to the implementation of the Master Plan improvements. Therefore, no additional employee commuter trips would occur when compared to existing conditions. Heavy duty truck trips associated with the delivery of
materials and off-haul of biosolids and grit would be expected to increase by an average of four round trips per day.

Table 4.5-6 shows a summary of the operational emissions associated with the improvements proposed under the Master Plan. As shown, the total emissions upon build out would be less than the identified significance thresholds. The table also shows that the net change in operational emissions associated with the proposed Master Plan improvements relative to existing conditions would in fact be a benefit as operational NOx, PM10, and PM2.5 emissions with the implementation of the Master Plan improvements would be lower than existing operational emissions from the facility. Furthermore, the analysis conservatively uses the same gas combustion emission factors for both the existing and future-year scenario (2035). However, the existing gas combustion engines at the cogeneration facility would be replaced by new and more efficient engines with the Best Available Control Technology (BACT), as required by the BAAQMD (BAAQMD, 2003) and the actual emissions would be even lower than shown in the table. Therefore, the overall operational impact of the proposed Master Plan improvements would be less than significant.

**Mitigation:** None required.

---

**Impact AQ-4:** Construction and operation of the proposed Master Plan improvements would expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions, a less-than-significant impact.

TAC emissions associated with the construction and operation of the proposed Master Plan improvements would have the potential to expose nearby sensitive receptors to an increased health risk. A qualitative approach to the determination of significance is used below for both construction and operation.

**Construction**

Construction of the Master Plan improvements would result in the short-term generation of DPM emissions from the use of off-road diesel equipment required to construct the proposed improvements, and from construction material deliveries and debris removal using on-road heavy-duty trucks. DPM is a complex mixture of chemicals and particulate matter that has been identified by the State of California as a TAC with potential cancer and chronic non-cancer effects. The dose to which receptors are exposed is the primary factor affecting health risk from TACs. Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period when assessing TACs (such as DPM) that have only cancer or chronic non-cancer health effects (OEHHA, 2003). However, such health risk assessments should be limited to the duration of the emission-producing activities associated with the project.
Construction activities associated with the Master Plan would take place over a period of 20 years, although the level of activity would vary both temporally and spatially at the WPCP site. The construction sources would be separated from the nearby receptors by a distance of more than 4,000 feet, which is substantially greater than the 1,000-foot screening distance used by the BAAQMD for the application of its quantitative thresholds. Furthermore, the PM_{10} and PM_{2.5} emissions associated with the construction of the various stages of the Master Plan that can be estimated, shown in Tables 4.5-4 and 4.5-5, would be less than 3 pounds per day. At these emission levels, with the large buffer distance separating the sources and receptors, construction activities associated with the Master Plan are not likely to lead to a significant impact from exposure to TACs. Therefore the construction related health risk impact of the Master Plan on nearby sensitive receptors would be less than significant.

**Operation**

During operation of the Master Plan, emissions would be generated from employee vehicle and haul truck trips, combustion of gas at the cogeneration facility, as well as the operation of the standby emergency generator for routine maintenance and testing.

The City is currently installing a standby diesel generator as part of the Primary Treatment Facility Project to be used to maintain WPCP operations in the case of a power outage. As part of the Master Plan improvements, a second diesel generator (up to 2,500 kW) would be installed concurrent with proposed secondary treatment facilities. The generator would be subject to the permitting requirements of BAAQMD Regulation 2 and as part of the permit application a health risk assessment would be required to ensure that the health risk associated with emissions from the testing and operation of the standby generator to nearby sensitive receptors would be less than significant. Besides, as the generator is proposed for use only during emergencies such as power outages and would be located within the treatment facility’s main operational area more than 4,000 feet from nearby sensitive receptors, no substantial health risks would be anticipated.

With the increase in digester gas production from the proposed secondary treatment facility and the implementation of the FOG program, it is anticipated that the cogeneration facility would not use natural gas for power generation in the future. Combustion of biogas does not result in substantial amounts of TACs or PM_{2.5}. Therefore, the cogeneration facility would not constitute a significant source of TACs and the associated impact at the nearest residential receptors would be less than significant. Again, these sources would be located more than three quarters of a mile from the nearest sensitive receptors, at buffer distances recognized by BAAQMD as adequate for maintaining less-than-significant exposure impacts from typical sources of TAC emissions. Furthermore, as the proposed cogeneration facility would be subject to BACT as required by the BAAQMD for new sources, emissions associated with combustion and the associated health risk would be substantially reduced relative to current conditions.

With regard to health risks from project-related vehicle trips, the only source of TACs would be the DPM generated by the daily haul truck trips to and from the Master Plan area. However, at build-out in 2035, a maximum of only a total of approximately four heavy haul truck trips are anticipated to occur daily at the Master Plan area during operations. Given the low amount of
daily haul truck trips, no substantial health risks would be introduced to the offsite sensitive receptors in the project vicinity.

Consequently, the operation of the proposed Master Plan improvements would not expose sensitive receptors to substantial TAC or PM$_{2.5}$ concentrations, and the associated impact would be less than significant.

**Mitigation:** None required.

---

**Impact AQ-5:** Implementation of the Master Plan improvements would create odors that could affect nearby sensitive receptors, a less-than-significant impact.

As described in the setting section, odors from wastewater treatment facilities are typically associated with biological activity that produces gaseous inorganic compounds. Odorous compounds produced from wastewater treatment plant operations include hydrogen sulfide, organic sulfur compounds, and ammonia and other nitrogen-containing compounds.

The BAAQMD has developed a list of recommended odor screening distances for specific odor-generating facilities such as wastewater treatment plants. If a proposed project would include the operation of an odor source, the screening distances should be used to evaluate the potential impact to existing sensitive receptors. The BAAQMD recommends that the screening distances be used as indicators of how much additional analysis would be required rather than the sole indicator of impact significance. The BAAQMD odor screening distance for wastewater treatment plants is 2 miles. The closest residences to the WPCP are single-family residences immediately south of SR 237, which are approximately 0.8 miles from the WPCP’s boundary. In addition, winds in the area tend to be southeasterly. This suggests that there is a potential for odor impacts to occur due to implementation of the Master Plan and additional analysis, including a review of existing odor complaint data, is warranted.

A review of BAAQMD odor complaint data compiled for the Sunnyvale WPCP indicates that there has been just one confirmed complaint associated with odors emanating from the WPCP between the period from February 6, 2011, through December 2014 (BAAQMD, 2015b) and there have been no odor complaints directly to the City or WPCP in the past five years (Berdeen, 2015). The BAAQMD considers an existing odor source to have a substantial number of odor complaints and an associated significant odor impact if the complaint history for the facility includes five or more confirmed complaints per year averaged over a 3-year period. As noted above, there were no confirmed odor complaints during the 3-year study period. Therefore, the BAAQMD would not consider the WPCP to have a substantial number of odor complaints and the odor impact associated with the existing conditions at the WPCP.

Currently, Ponds 1 and 2 associated with the existing secondary treatment system are a potential source of odors as they provide storage of flows during plant emergencies. Under the Master Plan, the existing secondary treatment system would be replaced with conventional activated
sludge facilities and Ponds 1 and 2 would no longer be used. Waste activated sludge from the proposed secondary treatment would be thickened within enclosed rotary drum thickeners and screw presses located within the Thickening/Dewatering Building, which would reduce the potential for odor complaints from thickening of biosolids (a process that currently occurs outside). As part of the Master Plan, a bioscrubber system is proposed to be used to treat odors from the solids handling facilities. A bioscrubber system consists of a vertical tower of synthetic media that hosts organisms that remove odorous compounds from air. Exhaust fans and ventilation would be installed in the new Thickening/Dewatering Building to extract enough air from the building to prevent fugitive emissions and provide sufficient air changes required for worker safety. The proposed odor control features would reduce the potential for exposure of nearby land uses to objectionable odors associated with these facilities.

The Master Plan includes construction of a FOG/food waste storage facility between 2025 and 2030. Digesting fats, oils, and grease, in addition to other liquid (emulsified) food wastes, can increase digester gas production. Depending on design and operating characteristics, this facility could be a potential source of odors. When the City undertakes design for the FOG/food waste storage facility it will evaluate the need for odor control measures such as limiting retention time for wastes, and installing odor control devices at building openings and vents.

Overall, the Master Plan improvements would not result in substantial odor impacts and would be less than significant.

Mitigation: None required.

4.5.4.5 WPF Impacts and Mitigation Measures

Impact WPF-AQ-1: Implementation of the WPF would generate emissions that would conflict with the 2010 Clean Air Plan, a significant and unavoidable impact.

Implementation of the WPF would be considered to be consistent with the 2010 CAP, if it would support the goals in the 2010 CAP. The recommended method for determining project support of these goals is consistency with the CEQA thresholds of significance. As presented in the discussion below of Impact WPF-AQ-2, emissions associated with the construction of the WPF would exceed the BAAQMD significance thresholds for construction during various stages of development (see Impact WPF-AQ-2, below). Even with the implementation of Mitigation Measures WPF-AQ-2a (Implement BAAQMD Basic Construction Mitigation Measures) and 2b (Implement BAAQMD Additional Construction Mitigation Measures), the residual impact would be significant and unavoidable. Therefore, the WPF would be considered to be inconsistent with the primary goals of the 2010 CAP, and the impact associated with conflicting or obstructing implementation of the applicable air quality plan would be significant and unavoidable.

Mitigation Measures: Implement Mitigation Measures WPF-AQ-2a and 2b.
Conclusion: Significant and Unavoidable. Implementation of the BAAQMD’s basic and additional construction mitigation measures listed in Mitigation Measures WPF-AQ-2a and WPF-AQ-2b would reduce potential impacts primarily from fugitive dust and from exhaust to a lesser extent. While these measures would reduce construction impacts from fugitive dust to a less-than-significant level, they are not likely to reduce emissions from construction equipment exhaust to levels below significance. Therefore, even with mitigation, construction of the WPF would be inconsistent with the 2010 Clean Air Plan. This impact would be significant and unavoidable.

Impact WPF-AQ-2: Construction activities associated with the WPF would generate emissions that could contribute to air quality violations, a significant and unavoidable impact.

WPF at the WPCP

Table 4.5-7 shows the estimated criteria air pollutant construction exhaust emissions for the proposed WPF stages, as calculated using the methodology discussed above under Approach to Analysis. Without adequate information about the nature of construction associated with Stage 1A, which includes retrofit of the existing primary effluent pipeline, and Stage 2E, which includes construction of the Diurnal Equalization storage, the associated emissions have not been quantified but are assumed to be significant due to the potential scale of the construction activities. As shown in the table, all criteria emissions associated with the other WPF stages would be less than the identified significance thresholds. Table 4.5-8 shows the combined impact of multiple WPF stages being developed simultaneously, as proposed by the City in its implementation schedule for the WPF. As shown in the table, combined construction exhaust emissions are likely to exceed or approach close to the identified significance thresholds several times during the 20-year WPF implementation period. In general, combined emissions would be expected to exceed significance thresholds when Stage 1A and Stage 2E overlap with other stages. Therefore, at this program level of analysis, construction exhaust emissions that would be associated with the proposed WPF would not likely contribute substantially to air quality violations with the exception of Stages 1A and 1E, which would be significant. The overall construction schedule is likely to change. As part of project-level CEQA, the City will update estimates of criteria air pollutant emissions as WPF improvements at the WPCP near implementation. Updated emissions estimates for specific improvements, as well as any improvements to be constructed concurrently, could differ from those reported herein, in which case mitigation may or may not be warranted.

Emissions of fugitive dust would also be generated by construction activities associated with grading and earth disturbance, travel on paved and unpaved roads, etc. With regard to fugitive dust emissions, the BAAQMD Guidelines consider the impact of fugitive dust emissions from construction activities to be less than significant if the recommended Basic and Additional Dust Control Measures contained in Mitigation Measures WPF-AQ-2a, Implement BAAQMD Basic Construction Mitigation Measures, and WPF-AQ-2b, Implement BAAQMD Additional Construction Mitigation Measures, are implemented. For all projects, the BAAQMD recommends
### TABLE 4.5-7

**WPF AVERAGE DAILY CONSTRUCTION EXHAUST EMISSIONS**

<table>
<thead>
<tr>
<th>WPF Construction Stage</th>
<th>Average Daily Emissions (pounds per day)</th>
<th>ROG</th>
<th>NOₓ</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
<th>Likely to be Significant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A – Rehabilitation of Existing WPCP Facilities</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>1B – Demolition of Primary Sedimentation Tanks and Relocation of Bay Trail access</td>
<td></td>
<td>2.2</td>
<td>20.1</td>
<td>1.5</td>
<td>1.6</td>
<td>No</td>
</tr>
<tr>
<td>2A – Membrane Bioreactor (MBR) Milestone 1</td>
<td></td>
<td>0.3</td>
<td>1.9</td>
<td>0.1</td>
<td>0.1</td>
<td>No</td>
</tr>
<tr>
<td>2B – Construction of Administration/Lab building</td>
<td></td>
<td>0.8</td>
<td>3.5</td>
<td>0.2</td>
<td>0.1</td>
<td>No</td>
</tr>
<tr>
<td>2C – Construction of Maintenance Building and Demolition of existing Administration Building</td>
<td></td>
<td>0.1</td>
<td>0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>No</td>
</tr>
<tr>
<td>2D – Maintenance Building</td>
<td></td>
<td>0.3</td>
<td>1.6</td>
<td>0.1</td>
<td>0.1</td>
<td>No</td>
</tr>
<tr>
<td>2E - MBR Milestone 2 (Diurnal Equalization, Thickening &amp; Dewatering; Decommissioning of Ponds 1 and 2)</td>
<td></td>
<td>1.8</td>
<td>8.2</td>
<td>0.4</td>
<td>0.3</td>
<td>No</td>
</tr>
<tr>
<td>3A – Demolition of Fixed Growth Reactors and AFTS</td>
<td></td>
<td>3.0</td>
<td>28.1</td>
<td>2.2</td>
<td>2.2</td>
<td>No</td>
</tr>
<tr>
<td>3B – Reverse Osmosis and Ultraviolet Disinfection Facilities</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>4A - Cogeneration, FOG &amp; Demolition of Primary Control Building</td>
<td></td>
<td>1.0</td>
<td>5.6</td>
<td>0.3</td>
<td>0.3</td>
<td>No</td>
</tr>
<tr>
<td>4B – Digester 5 and Biosolids Post-processing</td>
<td></td>
<td>0.8</td>
<td>3.5</td>
<td>0.2</td>
<td>0.1</td>
<td>No</td>
</tr>
<tr>
<td>4C – MBR Expansion</td>
<td></td>
<td>1.0</td>
<td>5.6</td>
<td>0.3</td>
<td>0.3</td>
<td>No</td>
</tr>
<tr>
<td>5A - Future Advanced Facilities (Denitrification Filters, Ozone, Microfiltration)</td>
<td></td>
<td>1.2</td>
<td>6.9</td>
<td>0.4</td>
<td>0.4</td>
<td>No</td>
</tr>
<tr>
<td><strong>Significance Thresholds</strong></td>
<td></td>
<td>54</td>
<td>54</td>
<td>82</td>
<td>54</td>
<td>--</td>
</tr>
</tbody>
</table>

**Note:** Refer to Appendix B for assumptions and emissions estimate calculations.

**NA = Not Available**

### TABLE 4.5-8

**COMBINED AVERAGE DAILY CONSTRUCTION EXHAUST EMISSIONS FROM OVERLAPPING WPF CONSTRUCTION STAGES**

<table>
<thead>
<tr>
<th>Overlapping WPF Construction Stages</th>
<th>Average Daily Emissions (pounds per day)</th>
<th>ROG</th>
<th>NOₓ</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
<th>Likely to be Significant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A &amp; 1B</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>1A &amp; 2B</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>1A, 1B, 2B &amp; 2E</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>2A, 2B &amp; 2E</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>2B &amp; 2E</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>2C, 2D &amp; 2E</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>2C &amp; 2E</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>2E &amp; 4A</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
</tbody>
</table>
4. Environmental Setting, Impacts, and Mitigation Measures

4.5 Air Quality

<table>
<thead>
<tr>
<th>Overlapping WPF Construction Stages</th>
<th>Average Daily Emissions (pounds per day)</th>
<th>ROG</th>
<th>NOx</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
<th>Likely to be Significant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>3A &amp; 3B</td>
<td></td>
<td>4.8</td>
<td>36.3</td>
<td>2.5</td>
<td>2.6</td>
<td>No</td>
</tr>
<tr>
<td>3B &amp; 4A</td>
<td></td>
<td>2.8</td>
<td>13.9</td>
<td>0.7</td>
<td>0.6</td>
<td>No</td>
</tr>
<tr>
<td>4A &amp; 4B</td>
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<td>1.7</td>
<td>9.2</td>
<td>0.5</td>
<td>0.5</td>
<td>No</td>
</tr>
<tr>
<td>2E &amp; 4B</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>4C &amp; 5A</td>
<td></td>
<td>2.2</td>
<td>12.5</td>
<td>0.7</td>
<td>0.7</td>
<td>No</td>
</tr>
<tr>
<td><strong>Significance Thresholds</strong></td>
<td></td>
<td>54</td>
<td>54</td>
<td>82</td>
<td>54</td>
<td>--</td>
</tr>
</tbody>
</table>

NOTE: Refer to Appendix B for assumptions and emissions estimate calculations.

NA = Not Available

the implementation of its Basic Control Mitigation Measures whether or not construction-related exhaust emissions exceed the applicable significance thresholds. For larger projects with the potential to exceed emissions thresholds, Additional Control Measures are recommended in addition to the Basic Measures. With implementation of these measures the impact of fugitive dust emissions would be less than significant.

**Injection Wells and Pipelines**

Insufficient information is available to estimate construction emissions for the injection wells and pipelines. Therefore, these components of the WPF have not been analyzed.

**Mitigation Measures**

**Mitigation Measure WPF-AQ-2a: Implement BAAQMD Basic Construction Mitigation Measures**

The District shall implement the following applicable BAAQMD Basic Construction Mitigation Measures to reduce emissions of fugitive dust and equipment exhaust:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material offsite shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
• All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

• Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

• All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified visible emissions evaluator.

• Post a publicly visible sign with the telephone number and person to contact at the District regarding dust complaints. This person shall respond and take corrective action within 48 hours.

Mitigation Measure WPF-AQ-2b: Implement BAAQMD Additional Construction Mitigation Measures

The District shall implement the following applicable BAAQMD Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Thresholds to further reduce emissions of fugitive dust and exhaust:

• All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.

• All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.

• Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.

• Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.

• The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.

• All trucks and equipment, including their tires, shall be washed off prior to leaving the site.

• Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.

• Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.

• Minimizing the idling time of diesel powered construction equipment to two minutes.
4. Environmental Setting, Impacts, and Mitigation Measures

4.5 Air Quality

• The District shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NOx reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of newer model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

• Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM.

• Requiring all contractors use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.

Conclusion: Significant and Unavoidable. While implementation of the BAAQMD's basic and additional construction mitigation measures would reduce construction impacts from fugitive dust to a less-than-significant level, they are not likely to reduce NOx emissions by more than 20 percent. Because not enough information is available to estimate construction-related air pollutant emissions that would be associated with Stages 1A or 2E, it cannot be substantiated that implementation of Mitigation Measures WPF-AQ-2a and 2b would be adequate to reduce the associated impacts to a less-than-significant level. Therefore, it is assumed that Stages 1A and 2E could result in significant impacts even with mitigation. Note that emissions at levels exceeding the threshold would only occur intermittently and for short periods during the 20-year construction period.

Impact WPF-AQ-3: Operational activities associated with the WPF would generate emissions that could contribute to air quality violations, a less-than-significant impact.

WPF at the WPCP

Emissions sources associated with the operation of the WPF at the WPCP would be the same as those discussed under Impact AQ-3 for the Master Plan. Changes to the cogeneration facility and standby power would be the same as those planned under the Master Plan. The WPF option would also include two 800 kW internal combustion engines at the cogeneration facility and a standby diesel generator of up to 2,500 kW. All the process changes in the WPF that would differ from what is proposed under the Master Plan would require electricity to operate and would not result in direct criteria pollutant emissions. Three to four new employees would operate the WPF at the WPCP, generating 12 new one-way trips per day. Upon build-out in 2035, traffic associated with material deliveries and off-hauling were assumed to be the same as under the Master Plan (approximately four round trips per day) to and from the WPCP.

Table 4.5-9 shows a summary of the operational emissions associated with the improvements proposed as part of the WPF. As shown, the total emissions upon build out would be less than the identified significance thresholds. The table also shows that the net change in operational emissions associated with the WPF relative to existing conditions would in fact be a benefit as operational NOx, PM10 and PM2.5 emissions with the implementation of the WPF would be lower than existing
operational emissions from the facility. Furthermore, the analysis conservatively uses the same gas combustion emission factors for both existing and future year scenario (2035). However, the existing gas combustion engines at the cogeneration facility would be replaced by new and more efficient engines with the Best Available Control Technology (BACT), as required by the BAAQMD (BAAQMD, 2003), and therefore, the actual emissions would be even lower than shown in the table. Therefore the overall operational impact of the proposed WPF would be less than significant.

### TABLE 4.5-9

**ANNUAL OPERATIONAL EMISSIONS AT THE WPCP FROM THE WPF**

<table>
<thead>
<tr>
<th>Emissions Source</th>
<th>Annual Emissions (tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROG</td>
</tr>
<tr>
<td>Proposed two 800 kW Engines (Uncontrolled)</td>
<td>0.35</td>
</tr>
<tr>
<td>Standby Diesel Generator</td>
<td>0.06</td>
</tr>
<tr>
<td>Offsite Vehicles</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>0.44</td>
</tr>
<tr>
<td><strong>Significance Thresholds</strong></td>
<td>10</td>
</tr>
<tr>
<td><strong>Significant Impact?</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Existing engines</strong></td>
<td>0.44</td>
</tr>
<tr>
<td><strong>Net change in Emissions</strong></td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Significance Thresholds</strong></td>
<td>10</td>
</tr>
<tr>
<td><strong>Significant Impact?</strong></td>
<td>No</td>
</tr>
</tbody>
</table>

**INJECTION WELLS AND PIPelines**

Operation of the injection wells and pipelines would use electricity and would not generate any direct emissions onsite. A minimal number of vehicle trips associated with the maintenance activities and groundwater sampling would be generated. However, emissions from these trips are not quantifiable at this stage.

**Mitigation:** None required.

**Impact WPF-AQ-4:** Construction and operation of the proposed WPF would expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions, a less-than-significant impact.

TAC emissions associated with the construction and operation of the proposed WPF would have the potential to expose nearby sensitive receptors to an increased health risk. A qualitative approach to the determination of significance is used below for both construction and operation.
Construction of WPF at the WPCP

Construction of the WPF would result in the short-term generation of DPM emissions from the use of off-road diesel equipment required to construct the proposed improvements, and from construction material deliveries and debris removal using on-road heavy-duty trucks. DPM is a complex mixture of chemicals and particulate matter that has been identified by the State of California as a TAC with potential cancer and chronic non-cancer effects. The dose to which receptors are exposed is the primary factor affecting health risk from TACs. Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period when assessing TACs (such as DPM) that have only cancer or chronic non-cancer health effects (OEHHA, 2003). However, such health risk assessments should be limited to the duration of the emission-producing activities associated with the Proposed Project.

Construction activities associated with the WPF would take place over a period of 20 years, although the level of activity would vary both temporally and spatially at the WPCP site. The construction sources would be separated from the nearby receptors by a distance of more than 4,000 feet, which is substantially greater than the 1,000-foot screening distance used by the BAAQMD for the application of its quantitative thresholds. Furthermore, as shown in Tables 4.5-7 and 4.5-8, the PM10 and PM2.5 emissions associated with the construction of the various stages of the WPF that can be estimated would be less than 3 pounds per day. At these emission levels, with the large buffer distance separating the sources and receptors, construction activities associated with the WPF are not likely to lead to a significant impact from exposure to TACs. Therefore the construction related health risk impact of the WPF on nearby sensitive receptors would be less than significant.

Construction of Injection Wells and Pipelines

The location of groundwater replenishment facilities proposed as part of the WPF has not yet been identified. However, any new pipelines, injection wells and recharge basins proposed would likely be located offsite south of the WPCP, within the cities of Sunnyvale, San José, Saratoga, Santa Clara, Cupertino, and Campbell. Construction associated with these facilities would be short term and would not be expected to expose any one receptor to DPM emissions from construction exhaust for longer than 2 weeks. Because the total emissions and duration of exposure at any one sensitive receptor location would be relatively minor compared to the 70-year exposure used in health risk assessments, the health risk from the short-term DPM emissions that would be associated with construction of the groundwater replenishment facilities associated with the WPF would be negligible, and this impact would be less than significant.

Operation of WPF at the WPCP

During operation of the WPF, emissions would be generated from employee vehicle and haul truck trips, combustion of gas at the cogeneration facility, as well as the operation of the standby emergency generator for routine maintenance and testing.
The proposed standby emergency generator (up to 2,500 kW) would be subject to the permitting requirements of BAAQMD Regulation 2 and as part of the permit application a health risk assessment would be required to ensure that the health risk associated with emissions from the testing and operation of the standby generator to nearby sensitive receptors would be less than significant. Besides, as the generator is proposed for use only during emergencies such as power outages and would be located within the treatment facility’s main operational area more than 4,000 feet from nearby sensitive receptors, no substantial health risks would be anticipated.

With the increase in digester gas production from the proposed secondary treatment facility and the implementation of the FOG program, it is anticipated that the cogeneration facility would not use natural gas for power generation in the future. Combustion of biogas does not result in substantial amounts of TACs or PM$_{2.5}$. Therefore, the cogeneration facility would not constitute a significant source of TACs and the associated impact at the nearest residential receptors would be less than significant. Again, these sources would be located more than three quarters of a mile from the nearest sensitive receptors, at buffer distances recognized by BAAQMD as adequate for maintaining less-than-significant exposure impacts from typical sources of TAC emissions. Furthermore, as the proposed cogeneration facility would be subject to BACT as required by the BAAQMD for new sources, emissions associated with combustion and the associated health risk would be substantially reduced relative to current conditions.

With regard to health risks from project-related vehicle trips, the only source of TACs would be the DPM generated by the daily haul truck trips to and from the WPCP. However, at build-out in 2035, a maximum of only a total of approximately four heavy haul truck trips are anticipated to occur daily at the WPCP during operations. Given the low amount of daily haul truck trips, no substantial health risks would be introduced to the offsite sensitive receptors in the project vicinity.

Consequently, the operation of the proposed WPF would not expose sensitive receptors to substantial TAC or PM$_{2.5}$ concentrations, and the associated impact would be less than significant.

**Operation of Injection Wells and Pipelines**

Equipment associated with the operation of the injection wells and pipelines would run on electricity and would not constitute a source of TAC or PM$_{2.5}$ emissions. Vehicle trips generated by maintenance activities and groundwater sampling would be minimal and this increase is not likely to increase the health risk exposure of nearby sensitive receptors.

**Mitigation:** None required.
Impact WPF-AQ-5: Implementation of the WPF would create odors that could affect nearby sensitive receptors, a less-than-significant impact.

**WPF at the WPCP, Injection Wells and Pipelines**

Inclusion of the WPF at the WPCP would not create any new source of odors at the WPCP and future odor characteristics would be as described under Impact AQ-5. The water replenishment facilities would not create any new sources of odor. This impact would therefore be less than significant.

**Mitigation:** None required.

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4.5.5 References


BAAQMD, 2015b. Odor Complaint Data for City of Sunnyvale Water Pollution Control Plant, 1440 Borregas Avenue, Sunnyvale, CA 94089, for January 1, 2009, through December 31, 2014, obtained from BAAQMD Public Records Section via electronic mail on September 17, 2015.


Berdeen, Bryan, WPC Operations and Maintenance Manager – CPO, City of Sunnyvale Water Pollution Control Plant, Email communication to Katy Rogers, Carollo Engineers, Inc., June 10, 2015.


CARB, 2015a. Toxic Air Contaminant Identification List. Available at: (http://www.arb.ca.gov/toxics/id/talist.htm) Accessed August 2015.


4.6 Greenhouse Gas Emissions

This section describes and evaluates issues related to greenhouse gas (GHG) emissions in the context of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan and the Water Purification Facilities (WPF). Discussed is an overview of climate change; the various GHGs that have been identified as drivers of climate change; pertinent regulations, including those relevant at federal, state, and local levels; the criteria used for determining the significance of environmental impacts; and potential impacts associated with implementation of the Master Plan or the WPF.

4.6.1 Background

4.6.1.1 Climate Change

There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions of GHGs, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Some of the potential effects of global warming in California may include loss of snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (California Air Resources Board [CARB], 2009). Globally, climate change has the potential to adversely affect numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. According to the International Panel on Climate Change (IPCC), the projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2013):

1. Warmer and/or fewer cold days and nights over most land areas;
2. Warmer and/or more frequent hot days and nights over most land areas;
3. Warm spells/heat waves. Frequency and/or duration increases over most land areas;
4. Heavy precipitation events. Increase in the frequency, intensity, and/or amount of heavy precipitation;
5. Increase in intensity and/or duration of drought;
6. Increase in intense tropical cyclone activity; and
7. Increased incidence and/or magnitude of extreme high sea level.

Also, there are many secondary effects projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.
4.6.1.2 Greenhouse Gases

GHG emissions include primarily carbon dioxide (CO₂), with much smaller amounts of nitrous oxide (N₂O) and methane (CH₄), often from unburned natural gas. Other sources of GHG emissions include sulfur hexafluoride (SF₆) from high voltage power equipment and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. Because different GHGs have different warming potential (i.e., the amount of heat trapped by a certain mass of a GHG), and CO₂ is the most common reference gas for climate change, GHG emissions often are quantified and reported in carbon dioxide-equivalent (CO₂e) emissions. For example, SF₆, while representing a small fraction of the total GHGs emitted annually worldwide, is a very potent GHG with 23,900 times the global warming potential of CO₂. Therefore, an emission of one metric ton of SF₆ would be reported as an emission of 23,900 metric tons CO₂e. The global warming potential of two GHGs associated with wastewater treatment, CH₄ and N₂O, are 21 times and 310 times that of CO₂, respectively (California Climate Action Registry [CCAR], 2009). Large emission sources are reported in million metric tons of CO₂e.

Greenhouse Gas Sources

There are two general sources of GHG emissions, anthropogenic and biogenic, both of which are relevant to wastewater treatment.

• **Anthropogenic** GHG emissions derive from the combustion of fossil fuels. Energy-related CO₂ emissions, resulting from fossil fuel exploration and use, account for approximately three-quarters of the human-generated GHG emissions in the United States, primarily in the form of CO₂ emissions from burning fossil fuels. Anthropogenic emissions also include bi-products of certain human-managed biological processes, such as anaerobic decomposition of organic waste in landfills, wastewater treatment, and treatment of wastes from confined animal facilities such as dairies.

• **Biogenic** GHG emissions are derived from natural sources, including the natural decomposition of biomass¹ and combustion of biomass or biomass-derived fuels.

The distinction between anthropogenic and biogenic sources of GHG emissions is important because these sources have different impacts on the global carbon cycle. Carbon in fossil fuel reservoirs, such as coal seams and oil and gas deposits, was removed from the atmosphere by plants over millions of years. Through geologic processes, this carbon accumulated in deposits and was isolated from the active carbon cycle. Without human intervention, fossil-fuel carbon would remain isolated from the active carbon cycle into the future. Through extraction and combustion of fossil fuels, humans release this carbon, increasing the total amount of carbon in the atmosphere and in the active carbon cycle (U.S. Environmental Protection Agency [U.S. EPA], 2011).

In contrast to fossil-fuel carbon, carbon present in biomass is cycling through the atmosphere and global carbon cycle on a much faster scale. For example, over the course of a year, carbon removed

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¹ Biomass is non-fossilized organic matter from plants, animals, and microorganisms, including products, byproducts, and wastes from agriculture, forestry and related industries, as well as the non-fossilized biodegradable fractions of industrial and municipal wastes, including gases and liquids recovered from its decomposition.
from the atmosphere by growing corn is released back into the atmosphere through the harvest, and subsequent combustion or decomposition of the corn biomass. Over short time scales, the mass of carbon released by the decomposition of biomass will generally equal the mass of carbon taken up by living organisms. Because biogenic carbon is constantly being released and taken up in the carbon cycle, biogenic CO₂ emissions do not act to increase the total amount of carbon in the atmosphere in the same way as the release of carbon from fossil fuels (U.S. EPA, 2011).

**Emissions Inventories**

Anthropogenic GHG emissions in the United States are derived mostly from the combustion of fossil fuels for transportation and power production. The total anthropogenic GHG emissions in 2013 were approximately 6,673 million metric tons of CO₂e. Energy-related CO₂ emissions resulting from fossil fuel exploration and use account for more than three-quarters of the human-generated GHG emissions, primarily in the form of CO₂ emissions from burning fossil fuels. Approximately one-third of the GHG emissions come from electricity production, such as power plants; approximately one-third derive from transportation; and a majority of the remaining sources include industrial processes, agriculture, forestry, other land uses, and waste management (U.S. EPA, 2015a).

Statewide emissions of GHG from relevant source categories for 2007 through 2013 are summarized in **Table 4.6-1**. In 2013, California produced 459.3 million metric tons of CO₂e emissions; Table 4.6-1 shows the percentages of GHG contributions by category for that year. Transportation was the source of 37 percent of the state’s GHG emissions, followed by industrial sources at 23 percent, electricity generation at 20 percent, commercial and residential sources at 12 percent, and other sources comprising the remaining 8 percent (CARB, 2015a). Although not included as an emission inventory category, water use requires significant amounts of energy. Approximately one-fifth of the electricity and one-third of the non-power plant natural gas consumed in the state are associated with water delivery, treatment, and use.

**TABLE 4.6-1**

<table>
<thead>
<tr>
<th>Emission Inventory Category</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>188.96</td>
<td>177.77</td>
<td>171.19</td>
<td>170.27</td>
<td>168.00</td>
<td>167.36</td>
<td>169.02</td>
</tr>
<tr>
<td>Electric Power</td>
<td>113.93</td>
<td>120.14</td>
<td>101.32</td>
<td>90.3</td>
<td>88.04</td>
<td>95.09</td>
<td>90.45</td>
</tr>
<tr>
<td>Commercial and Residential</td>
<td>43.15</td>
<td>43.47</td>
<td>43.7</td>
<td>44.88</td>
<td>45.4</td>
<td>42.88</td>
<td>43.54</td>
</tr>
<tr>
<td>Industrial</td>
<td>90.81</td>
<td>91.36</td>
<td>88.79</td>
<td>92.12</td>
<td>91.97</td>
<td>92.52</td>
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<tr>
<td>Recycling and Waste</td>
<td>8.1</td>
<td>8.27</td>
<td>8.39</td>
<td>8.46</td>
<td>8.75</td>
<td>8.77</td>
<td>8.87</td>
</tr>
<tr>
<td>High Global Warming Potential</td>
<td>11.6</td>
<td>12.61</td>
<td>13.83</td>
<td>15.49</td>
<td>16.78</td>
<td>17.77</td>
<td>18.5</td>
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<tr>
<td>Agriculture</td>
<td>36.04</td>
<td>36.48</td>
<td>34.86</td>
<td>34.5</td>
<td>35.68</td>
<td>36.43</td>
<td>36.21</td>
</tr>
<tr>
<td><strong>Total Gross Emissions</strong></td>
<td>492.6</td>
<td>490.1</td>
<td>462.07</td>
<td>456.02</td>
<td>454.61</td>
<td>460.82</td>
<td>459.28</td>
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</table>

SOURCE: CARB, 2015a
GHG Emissions at Wastewater Treatment Plants

The principal greenhouse gases generated by wastewater treatment plants are CH₄, N₂O and CO₂, which can be emitted directly by the wastewater treatment process or indirectly through the use of purchased electricity to power treatment processes.

Wastewater treatment processes can create a unique set of process and fugitive GHG emissions. Wastewater from domestic and industrial sources is treated to remove soluble organic matter, suspended solids, pathogenic organisms, and chemical contaminants. Soluble organic matter is generally removed using biological processes in which microorganisms consume the organic matter for cell maintenance and growth. The resulting biosolids are removed from the effluent prior to discharge to the receiving water.

Microorganisms can biodegrade soluble organic material in wastewater under aerobic or anaerobic conditions - it is anaerobic conditions that lead to the production of CH₄. During collection and treatment, wastewater may be accidentally or deliberately managed under anaerobic conditions. In addition, the resulting biosolids may be further biodegraded under aerobic or anaerobic conditions.

The generation of N₂O may also result from the treatment of domestic wastewater during both nitrification and denitrification² of the nitrogen present, usually in the form of urea, ammonia, and proteins. These compounds are converted to nitrate (NO₃) through the aerobic process of nitrification. Denitrification occurs under anoxic conditions (without free oxygen), and involves the biological conversion of nitrate into dinitrogen gas (N₂). N₂O can be an intermediate product of both processes, but is more often associated with denitrification.

Nationwide, wastewater treatment accounts for 2.5 percent of United States CH₄ emissions and 1.6 percent of N₂O emissions (CARB, 2010). Table 4.6-2 identifies sources of CH₄ and N₂O emissions generally associated with centralized wastewater treatment plants, as well as the data typically used to estimate GHG emissions from wastewater treatment plants in established protocols (CARB, 2010). While these emissions are associated with decomposition of fresh biomass, not fossil sources, they are included with anthropogenic GHG emissions for informational purposes.

In general, biodegradation of wastewater through aerobic processes produces primarily CO₂, while digestion through anaerobic processes can produce a mix of CH₄ and CO₂. N₂O is emitted during nitrification and denitrification processes associated with the degradation of nitrogen components in the wastewater. Wastewater treatment plants require energy to power pumps, blowers, aeration tanks, and other processes. Generally, energy is obtained from purchased electricity, which results in indirect GHG emissions, or by combustion of natural gas onsite, which results in the direct emission of CO₂ and CH₄. Fuel used for the transport and delivery of chemicals required in the treatment process and for the transport and disposal of biosolids is also a source of GHG emissions resulting from wastewater treatment processes.

² The purpose of nitrification and denitrification processes is to remove nitrogen from the wastewater. Nitrification is the biological oxidation of nitrogen-containing compounds like ammonia into nitrate. Nitrification is an aerobic process. Denitrification occurs under anoxic conditions and involves the biological conversion of nitrate into dinitrogen gas.
4.6 Greenhouse Gas Emissions

4.6.2 Regulatory Setting

4.6.2.1 Federal Regulations

On April 2, 2007, in Massachusetts v. U.S. Environmental Protection Agency (U.S. EPA), 549 US 497, the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. The Court held that the U.S. EPA must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the U.S. EPA is required to follow the language of Section 202(a) of the Clean Air Act. The Supreme Court decision resulted from a petition for rulemaking under Section 202(a) filed by more than a dozen environmental, renewable energy, and other organizations.

On April 17, 2009, the U.S. EPA Administrator signed proposed “endangerment” and “cause or contribute” findings for GHGs under Section 202(a) of the Clean Air Act. The U.S. EPA held a 60-day public comment period, considered public comments, and issued final findings. The U.S. EPA found that six GHGs taken in combination endanger both the public health and the public welfare of current and future generations. The U.S. EPA also found that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse effect as air pollution that endangers public health and welfare under Clean Air Act Section 202(a) (U.S. EPA, 2015b).

Specific GHG regulations that the U.S. EPA has adopted to date are as follows:

**40 CFR Part 98. Mandatory Reporting of Greenhouse Gases Rule.** This rule requires mandatory reporting of GHG emissions for facilities in nine industrial sectors that emit...
more than 25,000 metric tons of CO2e emissions per year (U.S. EPA, 2015c). Wastewater treatment plants are not among the nine industrial sectors identified in the rule.

40 CFR Parts 50, 52, 70 and 71. Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule. The rule establishes an approach for addressing GHG emissions from stationary sources regulated under the Prevention of Significant Deterioration [PSD] and Title V operating permit programs. The rule “tails” the thresholds for GHG emissions at much higher levels than criteria air pollutants and presents a phased approach for implementation, ultimately covering facilities responsible for 70 percent of national GHG emissions from stationary sources. Step 2 of the rule (phased in by June 30, 2013) mandates that PSD permitting requirements cover new projects with CO2e emissions of at least 100,000 tons per year, and that Title V operating permits apply to facilities that emit at least 100,000 tons per year of GHG emissions (U.S. EPA, 2015b). Although the Tailoring Rule does not distinguish between anthropogenic and biogenic emissions, on July 1, 2011, U.S. EPA issued a rule deferring permitting requirements for biogenic sources of stationary CO2 emissions from combustion or decomposition of biologically based materials for a period of three years.

4.6.2.2 State Regulations

There are a variety of statewide rules and regulations that have been implemented or are in development in California that mandate the quantification or reduction of GHGs as summarized below.

Executive Order S-3-05

Executive Order S-3-05 was established by Governor Arnold Schwarzenegger in June 2006 and establishes statewide emission reduction targets through the year 2050 as follows:

1. By 2010, reduce GHG emissions to 2000 levels;
2. By 2020, reduce GHG emissions to 1990 levels; and
3. By 2050, reduce GHG emissions to 80 percent below 1990 levels.

This executive order does not include any specific requirements that pertain to the proposed project; however, future actions taken by the state to implement these goals may affect the proposed project, depending on the specific implementation measures that are developed.

Assembly Bill 32

California Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, is the cornerstone of state efforts to reduce GHG emissions. As described below, the law requires the California Air Resources Board to establish a statewide GHG emissions cap for 2020 based on 1990 emission levels, develop a mandatory reporting program of GHG emissions, adopt regulations for discrete early actions to reduce GHG emissions, prepare a scoping plan to identify how emissions reductions will be achieved, and adopt a regulation that establishes a market-based compliance mechanism (also referred to as “Cap and Trade”).

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3 AB 32 is codified in California Health and Safety Code Division 25.5, Sections 38500 et seq.
Statewide GHG Emissions Cap

In 2007, CARB established the statewide GHG emissions limit that must be achieved by 2020, equivalent to the statewide GHG emissions levels in 1990, at 427 million metric tons of CO2e. This figure is approximately 30 percent below projected “business-as-usual” emissions of 596 million metric tons of CO2e for 2020, and about 10 percent below average annual GHG emissions during the period of 2002 through 2004 (CARB, 2009).

Mandatory Reporting Requirements

The GHG Mandatory Reporting Regulation\(^4\) classifies three types of reporting entities: facility, supplier (of natural gas, CO2, and transportation fuels), and electric power entity. Application of the regulation is determined based on the total emissions of all applicable source categories for each type of reporting entity. Under the program, biogenic emissions count toward reporting thresholds. Generally, cement production, lime manufacturing, nitric acid production, and petroleum refineries are subject to reporting regardless of their emissions level. Other facilities with greater than 25,000 metric tons CO2e of emissions (inclusive of fossil and biogenic emissions) are subject to full reporting requirements. (Facilities with emissions between 10,000 and 25,000 metric tons CO2e of emissions have the option to file an abbreviated report.)

The City is required to report WPCP emissions to CARB under the GHG Mandatory Reporting Regulation. Year 2014 emissions for the WPCP were 6,459 metric tons CO2e. Total non-biogenic CO2e emissions in 2014 were 2,471 metric tons of CO2e (CARB, 2015b).

Climate Change Scoping Plan

In December 2008, CARB approved the AB 32 Scoping Plan outlining the state’s strategy to achieve the 2020 GHG emissions limit. The Scoping Plan estimates a reduction of 174 million metric tons CO2e from the transportation, energy, agriculture, forestry, and high climate-change-potential sectors, and proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California’s energy sources, save energy, create new jobs, and enhance public health. The Scoping Plan expanded the list of the nine Early Action Measures into a list of 39 Recommended Actions contained in Appendices C and E of the Scoping Plan (CARB, 2009). Of these measures, the six that are associated with the water sector are presented in Table 4.6-3; however, these measures may not be directly applicable to wastewater treatment facilities projects such as the Master Plan.

The Scoping Plan must be updated every five years to evaluate the mix of AB 32 policies to ensure that California is on track to achieve the 2020 GHG reduction goal. CARB released the First Update to the Climate Change Scoping Plan in May 2014 (CARB, 2014). The Update builds upon the initial Scoping Plan with new strategies and recommendations. The Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The Update defines CARB’s climate change priorities for the next five years and sets the groundwork to reach California’s long-term climate

\(^4\) Codified in California Code of Regulations Title 17, Subchapter 10, Article 2, Section 95100 to 95133.
goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California’s progress toward meeting the near-term 2020 GHG emission reduction goals defined in the initial Scoping Plan.

Market-Based “Cap-and-Trade” Compliance Mechanism

AB 32 allows the use of market-based compliance mechanisms to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 also requires CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts. In response, CARB adopted a Cap-and-Trade program (first enforced in 2013) that covers major sources of GHG emissions such as refineries and power plants. The program includes an annual emissions cap that declines over time. There is no specific mention of wastewater treatment plants in the regulation.

Senate Bill 97

In 2007, the California State Legislature passed Senate Bill (SB) 97, which required amendment of the CEQA Guidelines to incorporate analysis of, and mitigation for, GHG emissions from projects subject to CEQA. The amendments took effect March 18, 2010. The amendments add Section 15064.4 to the CEQA Guidelines, specifically addressing the potential significance of GHG emissions. Section 15064.4 neither requires nor recommends a specific analytical methodology or quantitative criteria for determining the significance of GHG emissions. Rather, the section calls for a “good faith effort” to “describe, calculate or estimate” GHG emissions and indicates that the analysis of the significance of any GHG impacts should include consideration of the extent to which the project would:

- Increase or reduce GHG emissions;
- Exceed a locally applicable threshold of significance; or
- Comply with “regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.”

### TABLE 4.6-3

<table>
<thead>
<tr>
<th>ID #</th>
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<th>Strategy Name and Description</th>
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<td>W-2</td>
<td>Water</td>
<td>Water Recycling</td>
</tr>
<tr>
<td>W-3</td>
<td>Water</td>
<td>Water System Energy Efficiency</td>
</tr>
<tr>
<td>W-4</td>
<td>Water</td>
<td>Reuse Urban Runoff</td>
</tr>
<tr>
<td>W-5</td>
<td>Water</td>
<td>Increase Renewable Energy Production</td>
</tr>
<tr>
<td>W-6</td>
<td>Water</td>
<td>Public Goods Charge (Water)</td>
</tr>
</tbody>
</table>

SOURCE: CARB, 2009
The CEQA Guidelines also state that a project may be found to have a less-than-significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (Section 15064(h)(3)).

**CalGreen**

California was the first state in the country to adopt mandatory green building measures in its green building code. The California Green Building Standards Code (CalGreen) went into effect on January 1, 2011. CalGreen is a more stringent building code that requires, at a minimum, that new buildings and renovations in California meet certain sustainability and ecological standards. It means every new building built after January 1, 2011 will need to meet a certain baseline of efficiency and sustainability standards, raising the bar for what is allowable. CalGreen applies to both commercial and residential building permits.

CalGreen has two components – mandatory measures as well as voluntary measures. The mandatory measures are minimum baselines that must be met in order for a building to be approved. They range from water efficiency, indoor air quality, and sustainable building materials. Above and beyond these are the voluntary measures laid out in the code. These not only increase the efficiency of the building, but can be adopted by local jurisdictions wanting to enforce more stringent requirements.

### 4.6.2.3 Local Policies

**Bay Area Air Quality Management District**

On September 15, 2010, the Bay Area Air Quality Management District (BAAQMD) Board of Directors adopted the final *Bay Area 2010 Clean Air Plan* (2010 CAP). The 2010 CAP control strategies include revised, updated, and new measures in the three traditional control measure categories, including stationary sources measures, mobile source measures, and transportation control measures. In addition, the Bay Area 2010 CAP identifies two new categories of control measures, including land use and local impact measures and energy and climate measures (BAAQMD, 2010).

**City of Sunnyvale**

The City has several documents related to GHG emissions, including the *Sunnyvale General Plan*, the Sunnyvale Climate Action Plan, and other GHG-specific programs and policies, described below.

**Sunnyvale General Plan**

The Sunnyvale General Plan contains Citywide Vision Goal III, Environmental Sustainability, designed to promote environmental sustainability and remediation in the planning and development of the City, in the design and operation of public and private buildings, in the transportation system, in the use of potable water and in the recycling of waste (City of Sunnyvale, 2011). In order to implement this goal, the City seeks opportunities to utilize “green”
practices in its operation and delivery of services, and encourages residents and businesses to adopt such practices. These include reduced use of non-renewable energy, reduced emissions of GHGs, greater recycling of waste and use of recycled materials, reduced per-capita use of potable water, green building design, and reduced stormwater runoff.

The Land Use and Transportation Element (LUTE) of the General Plan is currently being updated to address Sunnyvale’s energy and water efficiency, land use, transportation, and air quality. The updated LUTE will address land use and transportation activity to sustain resources and encourage more efficient development through 2035. Together with the City’s Climate Action Plan (discussed below), the LUTE will contain policies and programs that are designed to help the City meet state legal requirements for GHG emissions reduction.

**Sunnyvale Climate Action Plan (CAP)**

The City of Sunnyvale Climate Action Plan (adopted on May 20, 2014) incorporates the City’s existing efforts and activities to reduce GHG emissions and builds upon components of the General Plan that, when implemented, would reduce GHG emissions from energy use, transportation, water use, waste disposal, and other activities. The strategies outlined in the CAP aim to not only reduce GHG emissions but also provide energy, fuel, water, and monetary savings while improving the quality of life in Sunnyvale. The CAP is intended to streamline future environmental review of development projects in Sunnyvale by following the CEQA Guidelines and meeting the BAAQMD’s expectations for a Qualified GHG Reduction Strategy.

The CAP also identifies how the City will achieve the state-recommended GHG emission reduction target of 15 percent below 2008 levels by the year 2020 (equivalent to 1990 emissions). The CAP provides goals and associated measures, also referred to as reduction measures, in the sectors of energy use, transportation, land use, water, solid waste, and off-road equipment. The City has a long-standing commitment to implementing environmental programs and proactively working to reduce GHG emissions.

Sunnyvale’s CAP uses a baseline year of 2008, in which the Sunnyvale community is estimated to have emitted approximately 1,270,170 metric tons of CO2e with wastewater treatment from the Sunnyvale WPCP accounting for 2,970 metric tons of CO2e. However, at the recommendation of the BAAQMD, stationary source emissions such as emissions from the WPCP are discussed in the CAP baseline inventory for informational purposes only, as stationary source emissions are influenced by market forces beyond the City’s local influence and are instead best addressed and regulated by the BAAQMD or through federal and state programs. The baseline inventory is intended to guide future local policy decisions that relate to emissions within the City’s influence; therefore, stationary source emissions are excluded from the CAP (City of Sunnyvale, 2014). In future years, with the implementation of existing actions, state programs, and GHG reduction measures in the CAP, 2020 GHG emissions in Sunnyvale are projected to be reduced by 434,890 metric tons CO2e, more than double the required GHG reductions necessary to meet AB 32 targets. To achieve these reductions, the CAP contains reduction strategies structured around ten impact areas: open space and urban forestry; decrease energy consumption; provide a sustainable energy portfolio; decrease water consumption; reduce landfilled waste; reduce off-road equipment emissions; increase and retain awareness of sustainability issues; improve mobility
through land use planning; expand sustainable circulation and transportation options; and optimize vehicular travel. Some measures are mandatory for all proposed development projects and others are voluntary. Voluntary measures could be incorporated as mitigation measures for proposed projects, at the City’s discretion. To tier from the City’s GHG Reduction Strategy, a project must conform to the City’s existing General Plan Land Use Diagram designation and implement the applicable mandatory measures in Attachment B of the strategy. Compliance with the mandatory measures and voluntary measures required by the City helps ensure an individual project’s consistency with the GHG Reduction Strategy.

The following goals and reduction measures are applicable to the Master Plan:

**Goal EC:** Improve energy efficiency and conservation in the community and City operations.

*EC-1 Lighting Efficiency.* Increase the use of efficient indoor and outdoor lighting technologies.

*EC-2 New Construction and Remodels.* Require green building practices in new residential and commercial development and remodels.

*EC-4 Commercial Energy Efficiency.* Establish a regulatory and incentive-based structure that facilitates commercial and industrial energy efficiency and conservation.

**Goal EP:** Increase the amount of renewable energy produced in the city and facilitate a higher renewable mix for energy delivered to the city.

*EP-1 Renewable Energy Portfolio.* Increase the renewable energy portfolio of electricity delivered to Sunnyvale so that more than 50 percent of delivered energy comes from renewable sources by 2035.

*EP-2 Local Renewable Energy.* Increase the number of renewable energy installations in and available to the community.

**Goal OR:** Minimize emissions from off-road lawn and garden and construction equipment.

*OR-2 Construction Equipment.* Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.

**Sunnyvale’s Green Building Program**

In 2010, the City Council adopted a Green Building Program to encourage construction of energy-efficient buildings that conserve natural resources and improve indoor air quality based on the CalGreen minimum requirements and Build It Green’s GreenPoint Rated program. The Green Building Program includes incentives, determined by the City Council, for buildings that exceed minimum green building standards.

**Sustainable Silicon Valley**

The City of Sunnyvale is a partner in Sustainable Silicon Valley, a collaborative effort among local government, regional agency, and private sector stakeholders. Sustainable Silicon Valley was created in 2000 by the California Environmental Protection Agency, Santa Clara Valley Water District, Silicon Valley Leadership Group, and Silicon Valley Environmental Partnership to
conserve resources and improve the environment in the Silicon Valley through comprehensive environmental management with a focus on the following six environmental pressures: 1) Use of energy from nonrenewable sources measured by CO₂ emissions; 2) Use of fresh water; 3) Urban sprawl; 4) Habitat development and fragmentation; 5) Use of nonrenewable raw materials; and 6) Discharges of toxic chemicals to the air.

**4.6.3 Impacts and Mitigation Measures**

**4.6.3.1 Thresholds of Significance**

For the purposes of this EIR, a GHG emissions impact is considered significant if implementation of the proposed project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The CEQA Guidelines state that a project may be found to have a less-than-significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (Section 15064.4(b)(3)). The City has established the Sunnyvale CAP as the GHG Reduction Strategy to meet the recommended considerations outlined in CEQA Guidelines Section 15064.4 and the recent standards for “qualified plans” as set forth by BAAQMD. This GHG impact analysis uses the Master Plan’s conformance with the Sunnyvale CAP as well as compliance with goals set forth in AB 32 and the 2010 Bay Area Clean Air Plan to assess the significance of the proposed project. In short, the Master Plan would have a significant impact if it does not comply with the Sunnyvale CAP, AB 32 goals, or the 2010 Bay Area Clean Air Plan.

CEQA allows for the significance criteria established by the applicable air district to be used to assess the impact of a project relative to GHG emissions. The quantitative thresholds for evaluating GHG emissions published in the BAAQMD CEQA Air Quality Guidelines updated in 2011 were stricken by an Alameda County Superior Court writ of mandate and in August 2013, the California Court of Appeal reversed the Alameda County Superior Court judgment. The California Supreme Court granted review of the case; however, only to address whether or not CEQA requires an analysis of how existing environmental conditions will impact future residents or users of a proposed project. On December 17, 2015, the Supreme Court concluded that agencies subject to CEQA generally are not required to analyze the impact of existing environmental conditions on a project’s future users or residents, reversing the Court of Appeal’s judgment on that issue. As of January 11, 2016, the BAAQMD has not yet released a formal response to the Supreme Court’s Decision, and has not reversed its interim position that it no longer recommends that its thresholds identified in its Air Quality Guidelines (2011) be used as a “generally applicable measure” of a project’s significant air quality and GHG impacts. However, the Decision does not appear to be directly applicable to the review of the Master Plan facilities, which would not include new future sensitive receptors. In addition, Lead agencies remain free
to apply any significance thresholds that are based on substantial evidence in the record including, but not limited to, the same thresholds that the BAAQMD identified in its *Air Quality Guidelines*.

The BAAQMD’s *Revised Draft Options and Justification Report (2009)* recommended an operational significance threshold of 10,000 metric tons per year of CO\textsubscript{2}e for projects involving stationary sources. The threshold level of 10,000 metric tons of CO\textsubscript{2}e per year represents a capture rate of approximately 95 percent of all GHG emissions from stationary sources in the San Francisco Bay Area Air Basin. This threshold level was calculated as an average of the combined CO\textsubscript{2}e emissions from all stationary source permit applications submitted to the BAAQMD during a three year analysis period (BAAQMD, 2009). This threshold is consistent with the Executive Order S-3-05 GHG emissions reductions goal of 80 percent below 1990 levels by 2050, which is roughly equivalent to 90 percent below current levels by 2050. This emissions reduction goal goes beyond the AB 32 emissions reduction goal established for 2020. The BAAQMD recommended that the stationary source threshold be used for projects that would accommodate processes and equipment that would emit GHG emissions and would require a BAAQMD permit. Implementation of Master Plan improvements would require a BAAQMD permit and would result in emissions of GHG. Therefore, based on the 2009 Report and the evidence cited therein, the 10,000 metric ton threshold is used in this analysis as an appropriate threshold to assess the significance of project-related emissions.

The BAAQMD’s 2009 Report did not identify a significance threshold for construction-related GHG emissions. For construction-related GHGs, the South Coast Air Quality Management District (SCAQMD) recommends that total emissions from construction be amortized over 30 years and added to operational emissions and then compared to the operations significance threshold (SCAQMD, 2008). Similar to the SCAQMD’s recommended approach for construction emissions, this analysis amortizes the construction emissions over a 30-year project lifetime and then adds those emissions to the operational emissions for comparison to the significance threshold of 10,000 metric tons CO\textsubscript{2}e per year.

Therefore, the project-related net annual GHG emissions (sum of annual operational emissions and the amortized annual construction emissions) would be considered to result in a significant impact on the environment if the net emissions would be more than 10,000 metric tons CO\textsubscript{2}e per year.

### 4.6.3.2 Approach to Analysis

The analysis included below is a program-level analysis of the GHG emissions associated with the proposed WPCP improvements and the WPF. The City will undertake further environmental review pursuant to CEQA when a determination is made to implement a WPCP improvement evaluated in the PEIR, conceptual design is completed and construction details developed, and prior to approval of that individual project. When the City undertakes subsequent environmental review, the information contained in this analysis will be revisited to determine the accuracy and the adequacy of these evaluations.
Consistency with Applicable Plans Related to GHG Reduction and Climate Change

CEQA requires the City to consider whether the project might conflict with the implementation of any applicable plan designed to address climate change. The analysis below considers potential conflicts between the project and the following plans: 1) Sunnyvale Climate Action Plan, and 2) CARB’s 2008 Climate Change Scoping Plan, as updated on May 22, 2014.

Construction of WPCP Improvements and WPF

Information available on construction of Master Plan improvements includes the type of construction activities, equipment to be used, and overall phasing (see Section 3.4.8 in Chapter 3, Project Description). Other details typically used to calculate GHG emissions (including the number of pieces of each type of off- and on-road equipment and daily equipment usage rates in terms of hours per day and total days of use) will not be available for some time. However, the type of construction activities and equipment to be used for proposed improvements at the WPCP would be similar to those identified for the City of Sunnyvale Primary Treatment Facility Project, to be constructed at the main plant beginning in 2016 (City of Sunnyvale, 2015). Detailed construction-phase GHG emissions were calculated for the three construction phases of the Primary Treatment Facility Project, and were used to estimate the relative magnitude of GHG emissions for similar activities proposed at the WPCP under the Master Plan and the WPF.

Phase 1 of the Primary Treatment Facility Project would involve earthwork activities such as site preparation, excavation, import of infill material, and off-hauling of surcharge; Phase 2 of the Primary Treatment Facility Project would include laying foundations, concrete work, backfilling and paving; while Phase 3 would involve activities associated with demolition and site restoration. GHG emissions estimates were prepared for each of these phases based on detailed and project- and phase-specific construction-related assumptions. With input from Carollo Engineers, the Master Plan improvements and WPF were associated with comparable phases (in terms of construction intensity) of Primary Treatment Facility Project construction. Note that this approach was not used for the following Master Plan improvements that lie outside the main plant: 1A – Existing WPCP Rehabilitation, 4A – Split Flow Conventional Activated Sludge Expansion (Diurnal Equalization) and 5A (Decommissioning of Ponds 1 and 2). The scale of construction involved in these improvements is not sufficiently understood at this time. Similarly, emissions were not estimated for improvements outside the main plant under the WPF or for WPF pipelines and injection wells due to lack of information.

When project-level CEQA review of Master Plan improvements is initiated, the City will review this analysis in light of available project-level construction information and update analyses accordingly.

The detailed emissions estimates prepared for the Primary Treatment Facility project are presented in the Sunnyvale Water Pollution Control Plant Primary Treatment Facility Project Initial Study/Mitigated Negative Declaration (SCH Number 2014112037), available at City of Sunnyvale Department of Public Works, 456 West Olive Avenue, Sunnyvale CA 94086). Approved in May 2015.
**Operation and Maintenance of WPCP Improvements and WPF**

Operational GHG emissions associated with the implementation of the WPCP improvements and WPF have been quantified using the methods described below and compared to the 10,000 metric tons per year threshold discussed above.

**Vehicle Exhaust Emissions**

Emissions that would be associated with commuting workers, material hauling, and deliveries were estimated using the EMFAC2014 emission factors for light-duty gasoline-fueled trucks and heavy-duty (T7) diesel-fueled trucks. The light-duty truck and heavy-duty emission factors were multiplied by the estimated long-term operation and maintenance-related employee vehicle miles travelled per year and the estimated additional haul truck miles travelled per year, respectively, that would be associated with the project. For a conservative analysis, EMFAC2014 vehicle emission factors for calendar year 2017 were used to estimate operation-related vehicle exhaust. The analysis assumes that each employee vehicle round trip would be 25 miles and each haul truck round trip would be 50 miles.

**Cogeneration Facility Emissions**

Based on the current blend of natural gas, digester gas, and landfill gas that is used at the WPCP’s cogeneration facility, approximately one-third of the total gas requirement is currently being met by natural gas purchased from Pacific Gas and Electric (PG&E), which results in exhaust emissions considered to be anthropogenic. Emissions related to combustion of digester and landfill gases are considered to be biogenic, and should not be included in the project emissions estimate. As discussed in more detail under the impact analysis (Section 4.6.3.4), the project could increase biogas production, and would result in the purchase of electricity from PG&E to make up the difference between WPCP energy demand and supply. No natural gas would be purchased from PG&E to fuel the WPCP in 2035. Therefore, there would be no anthropogenic emissions from the cogeneration facility with the implementation of the WPCP improvements and the WPF.

**Indirect Electricity Grid Emissions**

Indirect GHG emissions that would be generated by the WPCP improvements’ and WPF’s use of electricity from PG&E’s electrical grid at full buildout were estimated using an emission factor of 290 pounds of CO₂ per megawatt-hour (MWh) of electricity used. PG&E developed this emission factor for its energy production portfolio in 2020 (PG&E, 2015). N₂O and CH₄ emission factors for electricity were obtained from the U.S. Environmental Protection Agency (U.S. EPA, 2014). GHG emissions in the form of CO₂e were calculated by multiplying the N₂O and CH₄ emissions by their respective global warming potential, and then adding the CO₂, N₂O, and CH₄ emissions. Based on information provided by Carollo Engineers, implementation of the WPCP improvements would result in a total net increase in electricity demand over existing levels by approximately 18,177 MWh annually. The electricity demand would increase by approximately 52,341 MWh annually for the WPF (Carollo, 2015).
4.6.3.3 Impact Summary

Table 4.6-4 lists the project’s impacts associated with GHG emissions and the applicable significance determinations.

<table>
<thead>
<tr>
<th>Impacts</th>
<th>GHG-1: Conflict With Plan, Policy, or Regulation Regarding GHG Emissions</th>
<th>GHG-2: Generate GHG Emissions</th>
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<tr>
<td>Master Plan</td>
<td>LS</td>
<td>LS</td>
</tr>
<tr>
<td>Water Purification Facilities</td>
<td>LS</td>
<td>LS</td>
</tr>
</tbody>
</table>

LS = Less than Significant impact, no mitigation required.

4.6.3.4 Master Plan Impacts and Mitigation Measures

Impact GHG-1: Implementation of the WPCP improvements would not conflict with the Sunnyvale Climate Action Plan, or the GHG reduction goals set forth in AB 32, a less-than-significant impact.

Implementation of the WPCP improvements under the Master Plan would not conflict with the goals of the Sunnyvale CAP. While there are no goals and reduction measures that directly apply to the WPCP, by increasing the amount of biogas generated at the WPCP, the Master Plan would comply with the CAP’s goal to increase the amount of renewable energy produced in the City (Goal EP). Required compliance with the City’s Green Building Ordinance and replacement of the existing internal combustion engines at the cogeneration facility with new and more efficient engines would help comply with the CAP’s goal to increase energy efficiency and conservation in City operations (Goal EC). Therefore, the project would not conflict with GHG reduction goals set forth in the Sunnyvale CAP (the applicable GHG Reduction Strategy).

Table 4.6-3 presents the water-sector Recommended Action measures identified by CARB in its Climate Change Scoping Plan. Measure W-3, Water System Energy Efficiency, calls for more efficient use of energy associated with all aspects of the water sector, including wastewater management. Implementation of the Master Plan would include replacement of the existing internal combustion engines at the cogeneration facility with new cogeneration internal combustion engines that would increase the energy efficiency of the WPCP. In addition, the project would include a fats, oils, and grease (FOG) and food waste facility for digester operation. Operation of the FOG facility at the WPCP would boost digester gas production. The intent of Measure W-3 would be achieved under the project due to these proposed improvements. None of the other Scoping Plan measures appear to be directly applicable to the Master Plan. Therefore, the project would not conflict with implementation of the Scoping Plan.
4. Environmental Setting, Impacts, and Mitigation Measures

4.6 Greenhouse Gas Emissions

One 2010 Clean Air Plan Stationary Source Measure (SSM), referred to as SSM 15, *Greenhouse Gases in Permitting – Energy Efficiency*, would be directly applicable to the project. Similar to CARB’s Measure W-3, the intent of SSM 15 would be achieved through elements of the Master Plan such as replacement of the existing engines with new and more efficient cogeneration internal combustion engines and through implementation of a FOG program. Therefore, the project would support the primary goals of the 2010 Clean Air Plan, and would not disrupt or hinder implementation of any of the GHG-related 2010 Clean Air Plan control measures. Therefore, any potential impacts associated with conflicts with implementation of the 2010 CAP would be less than significant.

**Mitigation:** None required

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**Impact GHG-2:** Implementation of the Master Plan improvements would generate greenhouse gas emissions, a less-than-significant impact.

The project would generate emissions during both construction and operation of the WPCP improvements.

**Construction**

Construction of the proposed Master Plan improvements would generate GHG emissions associated with the use of heavy-duty off-road construction equipment and automobile and truck trips required to transport workers, materials, and debris to and from the Master Plan improvement sites. As detailed information required to calculate GHG emissions from construction activities is not available, emissions associated with construction of various WPCP improvements under the Master Plan were estimated using the GHG analysis conducted for the WPCP’s Primary Treatment Facility for comparison (see discussion in Section 4.6.3.2 for details regarding this approach). Table 4.6-5 shows the total estimated emissions that would be associated with construction of each stage of the Master Plan where information is available. As indicated in the table, emissions that would be associated with Stages 1A, 4A, and 5A have not been estimated because the scale of construction involved in these improvements is not well understood at this time. Subsequent project-level CEQA review of these improvements will be required when they are proposed for implementation.

As shown in Table 4.6-5, estimated GHG emissions generated by construction of proposed WPCP Master Plan improvements would total approximately 1,910 metric tons CO\textsubscript{2}e over the 20-year development period. The total amount of 1,910 metric tons CO\textsubscript{2}e equates to a 30-year amortized annual average value of approximately 64 metric tons CO\textsubscript{2}e (refer to Appendix C for assumptions associated with the GHG construction emissions). These GHG estimates for the WPCP improvements will be further refined during the project-level CEQA review of these components.
TABLE 4.6-5
ESTIMATED TOTAL GHG EMISSIONS FROM
MASTER PLAN-RELATED CONSTRUCTION ACTIVITIES

<table>
<thead>
<tr>
<th>Master Plan Improvements</th>
<th>CO\text{\textsubscript{2}}e (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A – Existing WPCP Rehabilitation</td>
<td>NA</td>
</tr>
<tr>
<td>1B – Demolition of Primary Sedimentation Tanks and Relocation of Bay Trail head</td>
<td>101</td>
</tr>
<tr>
<td>2A – Split Flow Conventional Activated Sludge Milestone 1</td>
<td>30</td>
</tr>
<tr>
<td>2B – Construction of Administration/Lab building</td>
<td>87</td>
</tr>
<tr>
<td>2C – Construction of Maintenance Building and Demolition of existing Administration Building</td>
<td>2</td>
</tr>
<tr>
<td>2D – Maintenance Building</td>
<td>26</td>
</tr>
<tr>
<td>2E - Split Flow Conventional Activated Sludge Milestone 2</td>
<td>579</td>
</tr>
<tr>
<td>2F - Split Flow Conventional Activated Sludge Milestone 3 (Thickening &amp; Dewatering)</td>
<td>169</td>
</tr>
<tr>
<td>3A – Filter Control Building</td>
<td>11</td>
</tr>
<tr>
<td>3B – Cogeneration Facility</td>
<td>89</td>
</tr>
<tr>
<td>3C – Food, Oil &amp; Grease Facility, Digester 5 &amp; Biosolids Post-processing</td>
<td>129</td>
</tr>
<tr>
<td>4A - Split Flow Conventional Activated Sludge Expansion (Diurnal Equalization)</td>
<td>NA</td>
</tr>
<tr>
<td>4B – Demolition of Fixed Growth Reactors (FGRs) and Air Flotation Tanks (AFTs)</td>
<td>142</td>
</tr>
<tr>
<td>4C - Split Flow Conventional Activated Sludge Clarifiers, Ammonia Feed &amp; Backwash Storage</td>
<td>77</td>
</tr>
<tr>
<td>5A – Decommissioning of oxidation ponds</td>
<td>NA</td>
</tr>
<tr>
<td>5B - Future Advanced Facilities (Denitrification Filters, Ozone, Microfiltration)</td>
<td>468</td>
</tr>
<tr>
<td>Total Combined Construction Emissions</td>
<td>1,910</td>
</tr>
<tr>
<td>30-Year Amortized Annual Average</td>
<td>64</td>
</tr>
</tbody>
</table>

NOTE: See Appendix C for all assumptions used to estimated construction emissions that would be associated with the Master Plan. NA = Not Available

**Operation**

The project would generate long-term GHG emissions associated with electrical power consumption and vehicle travel. The number of employees at the site is expected to remain the same as existing conditions with the implementation of the WPCP improvements. Direct emission sources that would generate GHGs during operation of the project would include up to an estimated 8 one way truck trips per day associated with chemical deliveries and off-hauling (e.g. biosolids, grit) at build-out. The WPCP’s cogeneration facility currently uses a combination of biogas from the digesters, landfill gas from the surrounding landfill, and natural gas purchased from PG&E to generate 1,087 kW of energy to meet the current power demand at the WPCP. At build out in 2035, the total power demand at the WPCP is expected to increase to approximately 3,100 kW. Though landfill gas is expected to decline in the future, biogas production is expected to increase from the added capacity of the proposed digesters as well as from the introduction of the FOG facility. As described in greater detail in Section 4.16, Energy Conservation, PG&E electricity would be purchased to make up the difference between WPCP energy demand and energy generated at the plant. It is assumed that no natural gas would be used at the cogeneration facility.
in year 2035. Emissions associated with combustion at the cogeneration facility that operates entirely on biogas would be considered biogenic and are therefore not reported in this analysis.

Indirect emissions would result from a total project-related net increase in electricity demand from PG&E’s power grid of approximately 18,180 MWh per year. Table 4.6-6 presents the estimated net annual emissions increases that would be associated with these operational sources. As indicated in the table, total CO2e emissions that would be associated with the project would be approximately 2,541 metric tons per year.

<table>
<thead>
<tr>
<th>Operation Emissions Source</th>
<th>CO2e (metric tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Exhaust</td>
<td>129</td>
</tr>
<tr>
<td>Net Increase in Indirect Emissions from Electricity Consumption</td>
<td>2,411</td>
</tr>
<tr>
<td><strong>Total Emissions</strong></td>
<td><strong>2,541</strong></td>
</tr>
</tbody>
</table>

NOTE: See Appendix C for all assumptions used to estimated construction emissions that would be associated with the Master Plan.

As shown in Table 4.6-7, the sum of estimated construction emissions amortized over 30 years and the total net operational emissions would not exceed the significance threshold of 10,000 metric tons CO2e per year. As discussed above, construction emissions that would be associated with Stages 1A, 4A, and 5A have not been estimated because the scale of construction involved in these improvements is not well understood at this time; however, even if the construction emissions that would be associated with Stages 1A, 4A, and 5A would be several orders of magnitude more than the combined emissions that have been estimated for construction of the other Master Plan improvements, the total amortized construction emissions combined with the net operational emissions would continue to be well below the significance threshold. Therefore, the associated impact would be considered less than significant.

<table>
<thead>
<tr>
<th>Operational Emissions Source</th>
<th>CO2e (metric tons per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-Year Amortized Construction Emissions</td>
<td>64</td>
</tr>
<tr>
<td>Total Net Operational Emissions</td>
<td>2,541</td>
</tr>
<tr>
<td><strong>Total Emissions</strong></td>
<td><strong>2,605</strong></td>
</tr>
<tr>
<td>Significance Threshold</td>
<td>10,000</td>
</tr>
<tr>
<td>Exceeds the threshold?</td>
<td>No</td>
</tr>
</tbody>
</table>

NOTE: See Appendix C for all assumptions used to estimated construction emissions that would be associated with the Master Plan.
Mitigation: None required.

4.6.3.5 WPF Impacts and Mitigation Measures

Impact WPF-GHG-1: Implementation of the WPF would not conflict with the Sunnyvale Climate Action Plan, or the GHG reduction goals set forth AB 32, a less-than-significant impact.

WPF at the WPCP, Pipelines, and Injection Wells

The following factors are pertinent regarding whether the WPF could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions (refer to the discussion under Impact GHG-1 for more information):

- Biogas generation and related increases in the amount of renewable energy produced at the WPCP, and replacement of the existing internal combustion engines at the cogeneration facility with newer, more efficient equipment would be as described for the Master Plan.

- The proposed WPF at the WPCP, pipelines, and injection wells would promote water recycling and are not expected to involve the inefficient use of energy, consistent with Climate Change Scoping Plan Measure W-3 (refer to Table 4.6-3).

For these reasons, implementation of the WPF would not conflict with GHG reduction goals set forth in the Sunnyvale Climate Action Plan, would not conflict with the Climate Change Scoping Plan, and would support the primary GHG-related goals of the 2010 Clean Air Plan.

Mitigation: None required.

Impact WPF-GHG-2: Implementation of the WPF would generate greenhouse gas emissions, a less-than-significant impact.

The proposed WPF would generate emissions during both construction and operation. As noted above in Section 4.6.3.2, emissions were not estimated for improvements outside the main plant under the WPF or for WPF pipelines and injection wells due to lack of information.

Construction

WPF at the WPCP. Similar to the Master Plan impacts described in Impact GHG-2, construction of the WPF at the WPCP would generate GHG emissions associated with the use of heavy-duty off-road construction equipment and automobile and truck trips required to transport workers, materials, and debris to and from the WPCP. GHG emissions from the construction of the various stages of the WPF at the WPCP were estimated and are presented in Table 4.6-8, below. As indicated in the table, emissions that would be associated with Stages 1A and 2E have not been estimated because the scale of construction involved in these improvements is not well understood at this time. Subsequent project-level CEQA review of these improvements will be required when they are proposed for implementation.
As shown in Table 4.6-8, it is estimated that GHG emissions generated by construction of the proposed WPF would total approximately 1,411 metric tons CO\textsubscript{2}e over the 20-year development period. The total amount of 1,411 metric tons CO\textsubscript{2}e equates to a 30-year amortized annual average value of approximately 47 metric tons CO\textsubscript{2}e (refer to Appendix C for assumptions associated with the GHG construction emission estimates). It should be noted that these GHG emission estimates for the WPF would be further refined during the project-level CEQA review for these facilities.

**Operation**

The proposed WPF would generate long-term GHG emissions associated with electrical power consumption and vehicle travel. Direct emission sources related to the WPF at the main plant would be similar to those discussed under the Master Plan above. At build-out, GHG emissions from mobile sources would be generated primarily from material haul truck trips (of up to 4 truck trips per day associated with chemical deliveries and material hauling). Three to four new employees would operate the WPF at the WPCP. For purposes of this analysis it was assumed that each employee would generate 1.5 light duty truck round trips per day, seven days per week. The number of additional employee round trips to the WPCP per year would increase by 2,190 for the WPF. There would be additional trips associated with the WPF to monitor water quality of the groundwater aquifers fed by the proposed injection wells as well as additional trips for the routine maintenance of the injection wells and pipelines. However, at this time, the number of these trips cannot be quantified.

### Table 4.6-8

<table>
<thead>
<tr>
<th>Stage - Master Plan Improvements</th>
<th>CO\textsubscript{2}e (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A – Rehabilitation of Existing WPCP Facilities</td>
<td>NA</td>
</tr>
<tr>
<td>1B – Demolition of Primary Sedimentation Tanks and Relocation of Bay Trail access</td>
<td>101</td>
</tr>
<tr>
<td>2A – Membrane Bioreactor Milestone 1</td>
<td>6</td>
</tr>
<tr>
<td>2B – Construction of Administration/Lab building</td>
<td>87</td>
</tr>
<tr>
<td>2C – Construction of Maintenance Building and Demolition of existing Administration Building</td>
<td>2</td>
</tr>
<tr>
<td>2D – Maintenance Building</td>
<td>26</td>
</tr>
<tr>
<td>2E – MBR Milestone 2 (Diurnal Equalization, Thickening &amp; Dewatering)</td>
<td>NA</td>
</tr>
<tr>
<td>3A – Demolition of Fixed Growth Reactors and AFTS</td>
<td>142</td>
</tr>
<tr>
<td>3B – Reverse Osmosis and Ultraviolet Disinfection Facilities</td>
<td>271</td>
</tr>
<tr>
<td>4A – Cogeneration, FOG &amp; Demolition of Primary Control Building</td>
<td>115</td>
</tr>
<tr>
<td>4B – Digester 5 and Biosolids Post-processing</td>
<td>116</td>
</tr>
<tr>
<td>4C – MBR Expansion</td>
<td>77</td>
</tr>
<tr>
<td>5A – Future Advanced Facilities (Denitrification Filters, Ozone, Microfiltration)</td>
<td>468</td>
</tr>
<tr>
<td><strong>Total Combined Construction Emissions</strong></td>
<td><strong>1,411</strong></td>
</tr>
<tr>
<td><strong>30-Year Amortized Annual Average</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

*NOTE: See Appendix C for all assumptions used to estimated construction emissions that would be associated with the proposed WPF.*

*NA = Not Available*
At build out of the WPF in 2035, the total power demand at the WPCP is expected to increase to approximately 7,000 kW per year. As described in greater detail in Section 4.16, Energy Conservation, PG&E electricity would be purchased to make up the difference between WPCP energy demand and energy generated at the plant. It is assumed that no natural gas would be used at the cogeneration facility in year 2035. Emissions associated with combustion at the cogeneration facility that operates entirely on biogas would be considered biogenic and have therefore not been reported in this analysis.

Indirect emissions would result from a total WPF-related net increase in electricity demand from PG&E’s power grid of approximately 52,341 MWh per year. The estimated net annual emissions increases that would be associated with these operational sources are presented in Table 4.6-9. As indicated in the table, total CO₂e emissions that would be associated with the operation of the proposed WPF would be approximately 7,094 metric tons per year.

<table>
<thead>
<tr>
<th>Operation Emissions Source</th>
<th>CO₂e (metric tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Exhaust</td>
<td>150</td>
</tr>
<tr>
<td>Net Increase in Indirect Emissions from Electricity Consumption</td>
<td>6,944</td>
</tr>
<tr>
<td><strong>Total Emissions</strong></td>
<td><strong>7,094</strong></td>
</tr>
</tbody>
</table>

NOTE: See Appendix C for all assumptions used to estimated construction emissions that would be associated with the proposed WPF.

As shown in Table 4.6-10, the sum of estimated construction emissions amortized over 30 years and the total net operational emissions would not exceed the significance threshold of 10,000 metric tons CO₂e per year. As discussed above, construction emissions that would be associated with Stages 1A and 2E have not been estimated because the scale of construction involved in these improvements is not well understood at this time; however, even if the construction emissions that would be associated with Stages 1A and 2E would be several orders of magnitude more than the combined emissions that have been estimated for construction of the other WPF Master Plan improvements, the total amortized construction emissions combined with the net operational emissions would continue to be well below the significance threshold. Therefore, the associated impact would be considered less than significant.

**Mitigation:** None required.
### 4.6 Greenhouse Gas Emissions

#### TABLE 4.6-10
TOTAL ESTIMATED OPERATIONS AND AMORTIZED CONSTRUCTION GHG EMISSIONS FOR THE WPF (2035)

<table>
<thead>
<tr>
<th>Operational Emissions Source</th>
<th>CO(_2)e (metric tons per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-Year Amortized Construction Emissions</td>
<td>47</td>
</tr>
<tr>
<td>Total Net Operational Emissions</td>
<td>7,094</td>
</tr>
<tr>
<td><strong>Total Emissions</strong></td>
<td><strong>7,141</strong></td>
</tr>
<tr>
<td>Significance Threshold</td>
<td>10,000</td>
</tr>
<tr>
<td>Exceeds the threshold?</td>
<td>No</td>
</tr>
</tbody>
</table>

**NOTE:** See Appendix C for all assumptions used to estimated construction emissions that would be associated with the proposed WPF.

#### 4.6.4 References


Carollo Engineers, 2015. Responses to requested information, August and September 2015.


City of Sunnyvale, 2015. Sunnyvale Water Pollution Control Plant Primary Treatment Facility Project Initial Study/Mitigated Negative Declaration. Approved May, 2015.


4.7 Biological Resources

This section describes the biological resources setting of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan (Master Plan) and the Water Purification Facilities (WPF), including sensitive habitats and natural communities such as tidal marsh areas, and special-status plant and wildlife species, as well as an assessment of impacts on those resources associated with implementation of the Master Plan or WPF.

4.7.1 Setting

The WPCP is located in Santa Clara County, California, in the northern portion of the city of Sunnyvale and in the Mountain View 7.5-minute U.S. Geological Survey (USGS) quadrangle. The Master Plan area is shown in Chapter 3, Project Description, Figure 3-3. The WPF would be located at the WPCP and the WPF groundwater replenishment facilities area (shown in Chapter 3, Project Description, Figure 3-12).

4.7.1.1 Master Plan

The 453.4-acre Master Plan area is situated on the fringe of San Francisco Bay and includes two oxidation ponds (Ponds 1 and 2), portions of the Moffett Channel, Cargill Channel, Sunnyvale West Channel, recreational trails, maintenance roads atop levees, sections of Carl Road and Caribbean Drive, an industrial area south of the WPCP (across Carl Road) that was used until recently for household hazardous waste drop-off events, and portions of the main plant. The Master Plan area is bounded by numerous aquatic features, industrial properties, and the Sunnyvale Landfill. Nearby land uses are shown in Section 4.2, Land Use, Figure 4.2-1. The main plant is bounded by the Sunnyvale West Channel to the west; Moffett Channel to the north, Cargill Channel to the northwest, and SCVWD Pond A4 to the north/northeast. The Don Edwards San Francisco Bay National Wildlife Refuge, which includes portions of the South Bay Salt Ponds Restoration Project, surrounds Ponds 1 and 2 and includes the Cargill Channel. Neighboring industrial properties include the Sunnyvale Materials Recovery and Transfer Station (SMaRT Station®), and additional industrial and office properties to the south of Caribbean Drive. The closed Sunnyvale Landfill, located to the south, west, and east of the main plant, consists of four refuse hills (from west to east): West Hill, Recycle Hill, South Hill, and East Hill, and is traversed by numerous hiking trails. With the exception of the SMaRT Station®, the former Household Hazardous Waste drop-off area next to Recycle Hill, the Sunnyvale Biosolids Monofill south of the SMaRT Station®, and a privately operated concrete recycling facility located on leased land at the East Hill, the closed landfill area is undeveloped. The Bay Trail is located along the northern and western perimeter of the main plant. Guadalupe Slough and San Francisco Bay are located to the north of the Master Plan area.

The topography of the Master Plan area is relatively flat, with an elevation range from 0 feet to 15 feet (North American Vertical Datum of 1988 [NAVD 88]). Six soil types underlie the Master Plan area (Natural Resources Conservation Service [NRCS], 2015): (1) Urban-land, 0 to 2 percent slopes, basins; (2) Xerorthents, trash substratum, 9 to 15 percent slopes; (3) Xerorthents, trash...
4.7 Biological Resources

substratum, 15 to 30 percent slopes; (4) Urban-land Embarcadero complex, 0 to 2 percent slopes, drained; (5) Novato clay 0 to 1 percent slopes, tidally flooded; and (6) Novato silty clay loam, excessive salinity, 0 to 1 percent slopes, protected. The majority of these soil types are alkaline and are either poorly drained fine-textured clays with a high water table, or Urban-land soils. The Urban-land series includes imported fill material in areas along the outer margins of the San Francisco Bay, as well as silty soils that have accumulated in tidally influenced salt marshes (NRCS, 2015). Three soil types in the Urban-land Hangerone and Novato series, and the Urban-land Embarcadero complex occur on the National List of Hydric Soils (NRCS, 2014), which includes soils that develop under sufficiently wet conditions to support the growth and regeneration of hydrophytic (wetland) vegetation.

4.7.1.2 Water Purification Facilities

The WPF would be located at the Sunnyvale WPCP (described above for the Master Plan) and the WPF groundwater replenishment facilities area, which includes existing recharge basins, the siting area for the proposed injection wells, and the alignments of potential purified water pipelines between these areas and the WPCP. Existing recharge basins that could be used for groundwater replenishment are in the City of Campbell and are part of the Los Gatos Groundwater Recharge System, near the intersection of State Routes (SR) 17 and 85. The District has not determined the specific locations of the injection wells, or the pipelines that would carry water from the WPCP to the injection wells. Injection wells would be sited within the WPF groundwater replenishment facilities area bordered by SR 85 to the south, San Tomas Aquino Creek to the east, and Calabazas Creek to the west. Pipeline alignments between the Sunnyvale WPCP, the injection well siting area, and the recharge basins could be located in the Cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara.

4.7.1.3 Biological Communities

Master Plan

Reconnaissance field surveys of the Master Plan area were conducted on 31 July 2015 by H. T. Harvey and Associates (HTH) Senior Wildlife Ecologist Patrick Stone, B.S., and on 3 August 2015 by HTH Plant Ecologist, Maya Goklany, M.S. The purpose of the reconnaissance surveys was to identify the biological resources, including sensitive habitats, present in the Master Plan area. Habitat information was also obtained from previous project activities in the area.¹

¹ Includes activities for the following projects: the Sunnyvale WPCP Preliminary Delineation of Wetlands and Other Waters (HTH, 2014a), Sunnyvale WPCP Master Plan and Primary Treatment Facility Design Biological Resources Constraints and Opportunities Report (HTH, 2014b), and the Santa Clara Valley Water District Sunnyvale East and West Channels Flood Protection Project Final Environmental Impact Report (Horizon, 2013). In addition, HTH ecologists conducted field surveys to assess biological conditions, determine the potential jurisdictional boundaries of wetlands and “other waters,” and determine the mean high water line and the high tide line within the Sunnyvale Channels project area, including the Master Plan area, in October and November 2010, January 2013, and May 2014.
Figure 4.7-1 shows the six general biotic habitat types identified in the Master Plan area (as shown in Figure 3-3): (1) open water, (2) northern coastal salt marsh, (3) coastal brackish marsh, (4) ruderal/non-native grassland, (5) landscaped, and (6) developed land. Table 4.7-1 provides a summary of the acreages of each habitat type in the Master Plan area.

### Table 4.7-1

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open water</td>
<td>401.5</td>
</tr>
<tr>
<td>Developed</td>
<td>29.3</td>
</tr>
<tr>
<td>Coastal brackish marsh</td>
<td>16.7</td>
</tr>
<tr>
<td>Ruderal/non-native grassland</td>
<td>3.2</td>
</tr>
<tr>
<td>Landscaped</td>
<td>2.2</td>
</tr>
<tr>
<td>Northern coastal salt marsh</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>453.4</strong></td>
</tr>
</tbody>
</table>

**Open Water**

Aquatic or open water habitats are permanently flooded, and support less than 5 percent vegetation cover in emergent or submerged states. Open waters in the Master Plan area consist of Ponds 1 and 2 (including their associated recirculation channels) and small portions of the Cargill Channel and the Sunnyvale West Channel.

**WPCP Oxidation Ponds**

Ponds in the Master Plan area include the WPCP oxidation ponds (Ponds 1 and 2) and their associated recirculation channels. Ponds 1 and 2 have been closed off from tidal influence and used for waste treatment for nearly 50 years (Refer to Section 2.1.2 in Chapter 2, Project Background, for a description of existing treatment processes, including pond operations.) Channels immediately surrounding Ponds 1 and 2 are used to facilitate water circulation to, from, and between the ponds. The area shown as “open water” on Figure 4.7-1 within the main plant is the north sludge lagoon and is similarly used for water treatment (digester cleanout, sludge storage and drying), and is intermittently dry.

Ponds 1 and 2 support a high diversity of waterbirds, based on data collected by birders (Santa Clara County Bird Data, unpublished; South Bay Birds List-serve 2015). Ducks and other waterfowl comprise the majority of the waterbirds using the oxidation ponds during most of the year, although large numbers of Wilson’s phalaropes (*Phalaropus tricolor*) and red-necked phalaropes (*Phalaropus lobatus*) forage in these ponds as well in late summer and early fall. At times, these ponds can support high densities of sandpipers and other shorebirds, in part because mud at the edges is exposed and/or accessible during periodic drawdowns. A number of other species, such as American white pelicans (*Pelecanus erythrorhynchos*), Forster’s terns (*Sterna forsteri*), and several species of herons and egrets also forage here.
The majority of these birds are nonbreeders that forage and roost in the ponds, and roost along the surrounding levees, during migration and in winter. Human disturbance by joggers, cyclists, and walkers along the levees surrounding the oxidation ponds inhibits nesting by birds on the levees. However, some waterbirds (particularly ducks) nest in vegetation around, and forage with their broods within, these ponds.

**Cargill Channel**

When SCVWD Pond A4 and the ponds west of Pond 2 were used for salt production, the Cargill Channel transferred water among the salt production ponds. These ponds are no longer used for salt production, and this channel was recently acquired by the U. S. Fish and Wildlife Service as part of Don Edwards San Francisco Bay National Wildlife Refuge. This channel is enclosed by levees; it is connected to the nontidal SCVWD Pond A4 by a siphon as well as to a managed pond west of Pond 2, which in turn is connected to the San Francisco Bay with a flap gate. Therefore, the Cargill Channel receives some water from Guadalupe Slough when the flap gate is open, but it is not a tidal waterbody. The waterbirds using the oxidation ponds also use the Cargill Channel, though in lower abundance. Salt and brackish water invertebrates and fish are present in the Cargill Channel, although special-status fish species are not likely to be present due to the poor connection with San Francisco Bay.

**Sunnyvale West Channel**

The Sunnyvale West Channel is a linear, channelized drainage feature that has full tidal influence from Moffett Channel, which connects to Guadalupe Slough and drains to San Francisco Bay. Its headwaters are located two miles south of the Master Plan area at West Maude Drive. The approximate extent of tidal influence in the Sunnyvale West Channel is near North Pastoria Avenue, well upstream from the Master Plan area (SCVWD, 2015). Open water portions of the Sunnyvale West Channel near the main plant are located at the Caribbean Drive crossing and at the effluent discharge location, and extend downstream to the confluence with Moffett Channel on the north side of the main plant. The drainage receives freshwater inputs from precipitation, stormwater and irrigation runoff, and effluent from the WPCP.

The Sunnyvale West Channel provides relatively low-quality habitat owing to its channelized nature, but several wildlife species use the open water within this channel. In 2008, the District relocated fish from the Sunnyvale Channels and only two species were observed: the California roach (*Lavinia symmetricus*) and Sacramento sucker (*Catostomus occidentalis*). Few additional native aquatic species are likely to occur in the Sunnyvale West Channel due to the relatively poor quality of the stream habitat; however, non-native crayfish (*Procambarus clarkii*) are present. Common, urban-adapted wildlife species such as native raccoons (*Procyon lotor*) and non-native rats (*Rattus rattus*) will make use of these channels as a source of water and for foraging. Common species of waterfowl that use shallow streams and are tolerant of high levels of human disturbance, including mallards (*Anas platyrhynchos*), American coots (*Fulica americana*), and pied-billed grebes (*Podilymbus podiceps*), occur along this channel. Insectivores such as dragonflies, bats, and fly-catching birds forage aerially over the channel, while herons and egrets forage in the channel.
Figure 4.7-1

Biotic Habitats in the Master Plan Area

LEGEND
- Proposed for Restoration Following Decommissioning
- Areas Proposed for Improvements Under the Master Plan
- Current Section 10 Jurisdictional (Mean High Water)
- Potential Section 404 Wetlands and Other Waters

Biotic Habitats
- Open Water
- Coastal Brackish Marsh
- Northern Coastal Salt Marsh
- Ruderal/Non-native Grassland
- Landscaped
- Developed

SOURCE: Esri, USGS, H.T. Harvey & Associates
Northern Coastal Salt Marsh

Northern coastal salt marsh is present in the Master Plan area only as a narrow strip along the Cargill Channel. Although the Cargill Channel is blocked from tidal influence, open water habitat and soils are sufficiently saline to support northern coastal salt marsh, which is considered a natural community of special concern (California Natural Diversity Database [CNDDB], 2015). This habitat is dominated by hydrophytic and salt-tolerant native forbs, such as pickleweed (*Salicornia* sp.) and alkali heath (*Frankenia salina*). Alkali Russian thistle (*Salsola soda*) is also common in this area, and is considered “moderately” invasive (Cal-IPC, 2015).

Salt marshes in the South Bay are mere remnants of their former extent. Where extensive salt marshes are still present, they support high densities, and fairly high diversity, of wildlife species, including several San Francisco Bay endemics. However, the narrow strip of salt marsh along the edge of the Cargill Channel is so limited in extent, and is separated from more extensive tidal marsh along Moffett Channel, that it provides relatively low-quality habitat for salt marsh animals. The state and federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) and the salt marsh wandering shrew (*Sorex vagrans halicoetes*), a California species of special concern, occur in the salt marshes of the South Bay, particularly where pickleweed is present. Therefore, there is some potential for these species to be present along the edge of the Cargill Channel. The Alameda song sparrow (*Melospiza melodia pusillula*), endemic to the Central and South San Francisco Bay, nests in dense herbaceous vegetation in salt marshes and nests along the Cargill Channel.

Coastal Brackish Marsh

Coastal brackish marsh habitat occurs in the Master Plan area in several locations. This habitat type is present within and directly adjacent to the Sunnyvale West Channel and the upper portions of the marsh along the Moffett Channel. Although the open water portion of the Moffett Channel is not within the Master Plan area, associated tidal marsh along the channel levee is within the planned improvements area. This habitat type also occurs in scattered, narrow patches along the edges of Ponds 1 and 2. Coastal brackish marsh is present (a) where vegetation is subject to tidal inundation but diluted by freshwater flows (from upstream and from WPCP releases), such as along the Sunnyvale West Channel and Moffett Channel, and (b) in areas blocked from tidal influence along the perimeters of Ponds 1 and 2.

Across the Master Plan area, this habitat type is dominated by emergent, vascular plant species adapted to intermediate (brackish) soil and water salinities. Short bulrushes such as sturdy bulrush (*Bolboschoenus robustus*) and alkali bulrush (*Bolboschoenus maritimus*) are key indicator species for this habitat type, and tend to co-dominate coastal brackish marsh with tall bulrushes, such as California bulrush (*Schoenoplectus californicus*) and hard-stemmed bulrush (*Schoenoplectus acutus*). Other common plant species that occur in this habitat include various species of cattails (*Typha spp.*), smartweed (*Persicaria punctata*), and broadleaved pepperweed (*Lepidium latifolium*), the latter of which is considered “highly” invasive by the California Invasive Plant Council (Cal-IPC, 2015). Coastal brackish marshes in the Master Plan area are limited in extent and fairly highly disturbed. Patches of brackish marsh within the Master Plan area are located adjacent to maintenance roads.
where moderate levels of human disturbance (e.g., from vehicles and pedestrians) occur regularly. Further, the relatively small size of the coastal brackish marshes within the Master Plan area limits the abundance and diversity of wildlife species expected to occur in these habitat patches. The Alameda song sparrow, San Francisco common yellowthroat (Geothlypis trichas sinuosa), and marsh wren (Cistothorus palustris) are common breeders in coastal brackish marshes, and multiple pairs nest and forage within this habitat in the Master Plan area. Freshwater marsh species, such as the red-winged blackbird (Agelaius phoeniceus), can also breed in coastal brackish marshes and will occur as foragers in this habitat year-round, while Virginia rails (Rallus limicola) and soras (Porzana carolina) occur in this habitat during winter and migration.

Insects with aquatic larvae, such as brine flies (family Ephydridae) and chironomid midges (family Chironomidae), breed in freshwater or brackish habitats and can occur in large swarms in the spring and summer in the Master Plan area, providing food for aerial foragers such as swallows. Common bird species foraging in this habitat are the great blue heron (Ardea herodias), great egret (Ardea alba), snowy egret (Egretta thula), and terrestrial wintering and migrating songbirds, including the golden-crowned sparrow (Zonotrichia atricapilla), white-crowned sparrow (Zonotrichia leucophrys), and Lincoln’s sparrow (Melospiza lincolnii).

Ruderal/Non-Native Grassland

Ruderal/non-native grassland habitat occurs throughout the Master Plan area on the upper slopes of the channel banks and levees, generally above the high tide line, and in dry areas north of Caribbean Drive. This habitat type is dominated by non-native grasses and forbs, some of which are considered invasive (Cal-IPC, 2015), including various species of wild oats (Avena spp.), smilo grass (Stipa miliacea), common fennel (Foeniculum vulgare) (rated as highly invasive), Italian thistle (Cirsium pycnocephalus) (rated as moderately invasive), bull mallow (Malva nicaensis), stinkwort (Dittrichia graveolens), and the highly invasive broadleaved pepperweed. Several trees also occur in ruderal/non-native grassland on the banks of the Sunnyvale West Channel, including hackberry (Celtis sp.) and lollypop tree (Myoporum luteum). Wildlife use of ruderal grasslands in much of the Master Plan area is limited by human disturbance, the limited extent of grassland areas, and the isolation of habitat remnants from more extensive grasslands. As a result, some of the wildlife species associated with extensive grasslands in the South Bay, such as the grasshopper sparrow (Ammmodramus savannarum), are absent from the patches of grassland within the Master Plan area. Many of the species that occur in grassland areas near the main plant are species that occur in adjacent urban areas and use these grasslands for foraging. Such species include the Brewer’s blackbird (Euphagus cyanocephalus), American crow (Corvus brachyrhynchos), black phoebe (Sayornis nigricans), mourning dove (Zenaida macroura), house finch (Haemorhous mexicanus), and California towhee (Melozone crissalis). However, species that occur in more extensive grassland areas, such as the western meadowlark (Sturnella neglecta) and loggerhead shrike (Lanius ludovicianus), can be found in the Master Plan area in limited numbers, primarily adjacent to the closed landfill.

California ground squirrels (Spermophilus beecheyi) occur in grassland habitats both within and adjacent to the Master Plan area. Ground squirrels are an important component of grassland communities, providing a prey base for diurnal raptors and terrestrial predators, as well as nesting and roosting habitat for burrowing owls (Athene cunicularia). Other rodent species that
occur in the ruderal/non-native grassland habitat in the Master Plan area include the California vole (*Microtus californicus*), valley pocket gopher (*Thomomys bottae*), and deer mouse (*Peromyscus maniculatus*). Diurnal raptors such as red-tailed hawks (*Buteo jamaicensis*), northern harriers (*Circus cyaneus*), and white-tailed kites (*Elanus leucurus*) forage for these small mammals over grasslands during the day, and at night nocturnal raptors, such as barn owls (*Tyto alba*), will forage for nocturnal rodents, such as deer mice. Red-tailed hawks, red-shouldered hawks (*Buteo lineatus*), and barn owls are adapted to urban areas and forage north of Caribbean Drive where relatively extensive areas of open habitat occur adjacent to developed urban areas.

Mammals such as the black-tailed jackrabbit (*Lepus californicus*) and striped skunk (*Mephitis mephitis*) utilize grasslands and ruderal habitats in the Master Plan area for foraging. Reptiles such as western fence lizards (*Sceloporus occidentalis*), western skinks (*Plestiodon skiltonianus*), western terrestrial garter snakes (*Thamnophis elegans*), and southern alligator lizards (*Elgaria multicarinata*) frequent grassland habitats, and are expected to occur in the Master Plan area.

**Landscaped Habitat**

Within the Master Plan area, landscaped habitat consists of small maintained areas in the main plant facilities that support oleander (*Nerium oleander*) shrubs and mature trees, including various species of eucalyptus (primarily *Eucalyptus globulus* and *E. camaldulensis*), pepper tree (*Schinus molle*), coast redwood (*Sequoia sempervirens*), alder (*Alnus* sp.), pine (*Pinus* sp.), and lollypop tree. Ice plant (*Carpobrotus* sp.) occurs in the understory of landscaped habitat in some areas, which is considered “highly” invasive (Cal-IPC, 2015).

Several common, urban-adapted wildlife species occur in the landscaped portions of the Master Plan area. Landscaped vegetation growing within or adjacent to the Master Plan area provides cover and nesting habitat for common, urban-adapted bird species, such as Anna’s hummingbirds (*Calypte anna*) and American robins (*Turdus migratorius*). Reptiles and amphibians such as Sierran chorus frogs, western fence lizards, and western terrestrial garter snakes may use or move through landscaped portions of the Master Plan area, and many common mammals, such as raccoons and striped skunk, are well adapted to using urban landscaping in the region.

Small cavities and exfoliating bark on trees and crevices in culverts may provide roosting habitat for bats within the Master Plan area. Individual bats, such as big brown bats (*Eptesicus fuscus*) and Yuma myotis (*Myotis yumanensis*), may roost in small cavities in trees in the Master Plan area, and hoary bats (*Lasiurus cinereus*) and western red bats (*Lasiurus blossevillii*) may roost in the foliage of trees. However, trees with cavities of sufficient size to support large colonies of roosting bats are not present, and the number of bats that may roost in the Master Plan area is very low.

**Developed Habitat**

Within the Master Plan area, developed habitat consists of the main plant facilities, graveled maintenance roads located on the tops of levees, a portion of the Bay Trail, and hardscape, such as parking lots, Caribbean Drive, and Carl Road. Although developed areas provide little habitat value to plants and wildlife, buildings and other artificial structures provide nesting habitat for
avian species such as the cliff swallow (Petrochelidon pyrrhonota), barn swallow (Hirundo rustica), black phoebe, and house finch. In addition, the common wildlife species discussed above as using landscaped and ruderal grassland habitats may occasionally occur in or pass through developed portions of the Master Plan area.

**Water Purification Facilities**

Biotic habitats with the potential to occur in the WPF groundwater replenishment facilities area (shown in Figure 3-12 in Chapter 3, Project Description) were identified based on review of aerial imagery (Google Inc., 2015), natural communities of special concern listed in the California Natural Diversity Database (CNDDB, 2015), the Santa Clara Valley Habitat Plan (Habitat Plan) land cover types (SCVHA, 2015), and the project ecologists’ familiarity with the biotic habitats, plants, and wildlife of Santa Clara County and the South San Francisco Bay Region. Eight habitat types potentially occur in the WPF groundwater replenishment facilities area: (1) developed/landscaped areas, (2) ruderal/non-native grasslands, (3) riparian forest and woodland; (4) riparian scrub-shrub; (5) broadleaved upland woodland; (6) open water, (7) coastal and valley freshwater marsh, and (8) seasonal wetland.

The majority of the groundwater replenishment facilities area is covered by developed land and is a dense urban matrix of commercial and industrial lands, roadways, and residential neighborhoods. Landscaping is associated with development, and includes irrigated lawns of sport fields and parks. Ruderal/non-native grassland habitat is also interspersed among developed areas and is distinguished from California annual grassland by its lack of native herbaceous vegetation. California annual grassland is not expected to occur in this area. Open water habitat may include freshwater perennial stream, intermittent stream, and groundwater recharge/percolation ponds. Coastal and valley freshwater marsh and seasonal wetlands have the potential to occur within and adjacent to these streams in the groundwater replenishment facilities area. Riparian habitats also occur along the edges of these streams and extend above the top of the stream banks into the active floodplains. Outside of riparian corridors, the WPF groundwater replenishment facilities area supports small patches of broadleaved upland woodland.

Similar to the Master Plan area, ruderal grassland habitats and landscaped areas in the WPF groundwater replenishment facilities area may support an assemblage of urban-adapted wildlife species, including red-tailed hawks, red-shouldered hawks, barn owls, Brewer’s blackbirds, American crows, black phoebes, mourning doves, house finches, California towhees, western fence lizards, western terrestrial garter snakes, California ground squirrels, California voles, valley pocket gophers, deer mice, striped skunks, and non-native rats. In addition, freshwater streams, riparian habitats, and forests can support a large diversity of wildlife, although these habitats are generally limited in extent and quality in WPF area as a result of heavy urbanization and development. Resident and migratory wildlife species commonly occurring in association with the freshwater streams, riparian corridors, and wetlands in the region include mallards, American coots, egrets, herons, house finches, song sparrows, warblers, blackbirds, western pond turtles (Actinemys marmorata), non-native red-eared sliders (Trachemys scripta elegans), Sierran chorus frogs, western toads, coyotes, and raccoons.
4.7.1.4 Potential Jurisdictional Areas / Sensitive Habitats

**Master Plan**

U.S. Army Corps of Engineers Jurisdiction (Waters of the U.S.)

“Waters of the U.S.” include wetlands and other waters that are regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Appropriation Act. The City has submitted a preliminary jurisdictional delineation of Waters of the U.S. for the Master Plan area to the USACE and is awaiting a jurisdictional determination of Waters of the U.S.

Section 404 wetlands and other waters are defined in 33 Code of Federal Regulations (CFR) Parts 323.2 and 328.3, respectively. These specific definitions are provided under Section 4.7.2.1 below. There are approximately 2.8 acres of potential Section 404 wetlands and other waters in the Master Plan area (shown in Figure 4.7-1). Open water habitat subject to Section 404 of the CWA is limited to the Cargill Channel and Sunnyvale West Channel. Section 404 of the CWA also applies to northern coastal salt marsh and coastal brackish marsh associated with the Cargill Channel, Sunnyvale West Channel, and Moffett Channel. However, bodies of water used for waste treatment processes may be exempt from regulation as Waters of the U.S. under the provisions of 33 CFR Part 328.3(a)(8). Therefore, open water and coastal brackish marsh associated with Ponds 1 and 2, their associated recirculation channels, and the detention pond in the main plant area are likely not subject to USACE jurisdiction as long as they continue to be used for wastewater treatment (refer to Section 4.7.2.1 below for more detailed information).

The USACE also regulates the aquatic or open waters component of bay habitat under Section 10 of the Rivers and Harbors Appropriation Act. Section 10 applies to “navigable Waters of the U.S.”, which is defined in 33 CFR, Part 329.4 to include all waters subject to the ebb and flow of the tide, and/or those which are presently or have historically been used to transport commerce. The shoreward jurisdictional limit of tidal waters is further defined in 33 CFR, Part 329.12, and in Section 4.7.2.1 Federal Regulations below. There are approximately 1.9 acres of current Section 10 other waters in the Master Plan area along the Sunnyvale West Channel (see Figure 4.7-1). There is overlap between open-water areas that are regulated by Section 10 and Section 404.

Under Section 10 of the Rivers and Harbors Appropriation Act, USACE may also take jurisdiction over areas that were historically navigable but are no longer navigable. Historical Section 10 Waters are defined in 33 CFR, Part 329.9 and in Section 4.7.2.1 Federal Regulations below, and can include areas that have been filled or hydrologically disconnected from jurisdictional features. Historical Section 10 Waters may occur behind levees, and are currently not exposed to tidal or muted-tidal influence.

**Figure 4.7-2** depicts potential Historical Section 10 Waters in the Master Plan area, and includes all primary historical sloughs, which are marked with a double blue-line. Historical sloughs bisect Ponds 1 and 2, the Cargill Channel, Moffett Channel, and Sunnyvale West Channel, as well as some of the levees in the Master Plan area.
Regional Water Quality Control Board Jurisdiction (Waters of the State)

“Waters of the State” include wetlands, other waters, and riparian habitats regulated by the Regional Water Quality Control Board (RWQCB) under the CWA and the State’s Porter-Cologne Water Quality Control Act (Porter-Cologne). Porter-Cologne broadly defines Waters of the State as “any surface water or groundwater, including saline waters, within the boundaries of the state.” In practice, the San Francisco RWQCB takes jurisdiction over riparian habitat and/or all areas below the top of stream banks and levees (see Section 4.7.2.2 State Regulations for an expanded discussion). Because Porter-Cologne applies to any water, whereas the CWA applies only to certain waters, California’s jurisdictional reach overlaps and may exceed the boundaries of Waters of the U.S.

In the Master Plan area, Waters of the State encompass all Waters of the U.S. as described above. In addition, the San Francisco RWQCB may claim jurisdiction over upland habitat (e.g. ruderal/non-native grassland) that is situated below the top of the levees in the Master Plan area. It is likely that the open water and coastal brackish marsh habitats associated with Ponds 1 and 2 and the north sludge lagoon would not be considered Waters of the State by the RWQCB as long as they continue to be used for wastewater treatment in accordance with a National Pollutant Discharge Elimination System (NPDES) permit.

California Department of Fish and Wildlife Jurisdiction

Areas that fall under the jurisdiction of CDFW include the bed and banks of rivers, lakes, and streams according to provisions of Sections 1601–1603 of the Fish and Game Code. Streams and riparian habitat are defined in Title 14, California Code of Regulations, Section 1.72, and Fish and Game Code Section 2786, respectively. Using these definitions, the lateral extent of a stream and associated riparian habitat would fall under the jurisdiction of CDFW. These regulations are discussed in greater detail under Section 4.7.2.2 State Regulations below. In the Master Plan area, the Sunnyvale West Channel and associated open water, coastal brackish marsh, and ruderal/non-native grassland habitats below the top of the levee that encloses it, and possibly tidal marsh along Moffett Channel, would potentially fall under CDFW jurisdiction.

Bay Conservation and Development Commission

As described in Section 4.2.2.2 (in Section 4.2, Land Use and Recreation), the McAteer-Petris Act granted the Bay Conservation and Development Commission (BCDC) jurisdiction over all tidal areas, including sloughs, marshlands, submerged lands, salt ponds, and managed wetlands, within 100 feet inland from the shoreline of San Francisco Bay. Approximately 24.5 acres of the Master Plan area are potentially subject to BCDC jurisdiction, including tidal areas and the 100-foot shoreline band along the northern edges of Ponds 1 and 2, the eastern edge of Pond 1, the Cargill Channel, the Moffett Channel, and the Sunnyvale West Channel. Figure 4.7-3 depicts these areas.
LEGEND
- Proposed for Restoration Following Decommissioning
- Areas Proposed for Improvements Under the Master Plan
- Historical Section 10 Jurisdictional Limit
- Historical Sloughs

SOURCE: * The primary source is the maps of the United States Coast Survey (USCS; later US Coast and Geodetic Survey). Digitized by the San Francisco Estuary Institute (SFEI).
Figure 4.7-3
BCDC Jurisdiction in the Master Plan Area
Natural Communities of Special Concern

Five natural communities of special concern are documented in Rarefind (CNDDB, 2015) as occurring in the Master Plan region. These sensitive habitats include: (1) north central coast California roach/stickleback/steelhead stream, (2) north central coast steelhead/sculpin stream, (3) northern coastal salt marsh, (4) serpentine bunchgrass, and (5) valley oak woodland. The CNDDB (2015) has documented one sensitive habitat, northern coastal salt marsh, in the vicinity of the Master Plan area (see Figure 4.7-4). This habitat type occurs within the boundaries of the Master Plan area only as a narrow strip along the edge of the Cargill Channel (Figure 4.7-1). Northern coastal salt marsh is characterized by Holland (1986) as occurring along sheltered inland margins of bays, often co-dominated by pickleweed, cordgrass (*Spartina* spp.), and sometimes saltgrass (*Distichlis spicata*).

In addition to tracking sensitive habitats in Rarefind, the CDFW ranks sensitive vegetation alliances based on their global and state rankings analogous to those provided in the CNDDB, using NatureServe’s standard heritage program methodology. The global (G) and state (S) ranks are a reflection of the overall condition (rarity and endangerment) of an element throughout its range. If an alliance has been designated as 1-3 for its G or S ranks, all of the associations within it would also be of high priority. The CDFW’s Vegetation Classification and Mapping Program provides the currently accepted list of vegetation alliances and associations (CDFW, 2010). Sensitive alliances present in the Master Plan area include pickleweed (G4/S3), which is a dominant species in the northern coastal salt marsh habitat along the Cargill Channel, and alkali bulrush (G4/S3), which is a dominant species in coastal brackish marsh habitat along the Moffett Channel, and surrounding Ponds 1 and 2.

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2 Rarefind is a computer application that allows for querying and reporting of data from the CNDDB, a program that inventories the status and locations of rare plants and animals in California.

3 Defined as the Mountain View USGS 7.5-minute quadrangle map in which the Master Plan area occurs, and the surrounding eight quadrangles including Redwood Point, Newark, Niles, Palo Alto, Milpitas, Mindego Hill, Cupertino, and San José West.

4 The CNDDB is a “natural heritage program” that inventories the status and locations of rare plants and animals in California, and is part of a nationwide network of similar programs overseen by the non-profit organization NatureServe. NatureServe network members, which include CDFW staff, collect and analyze data about the plants, animals, and ecological communities of the Western Hemisphere and are the leading source of information on the precise locations and conditions of at-risk species and threatened ecosystems in their jurisdictions.

5 Definitions of the ranking system used by NatureServe’s standard heritage program methodology are as follows (G and S rank definitions are synonymous):

- 1 = Less than 6 viable occurrences, or less than 1,000 individuals, or less than 2,000 acres
- 2 = Between 6 and 20 viable occurrences, or 1,000 to 3,000 individuals, or 2,000 to 10,000 acres
- 3 = Between 21 and 100 viable occurrences, or 3,000 to 10,000 individuals, or 10,000 to 50,000 acres.
- 4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat
- 5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world (CDFG, 2007; NatureServe, 2014).
Non-Native and Invasive Species

Several non-native, invasive species occur in the Master Plan area. Of these, broadleaved pepperweed and ice plant are the most abundant, and are rated as highly invasive, having severe ecological impacts (Cal-IPC, 2015). Common fennel is also considered highly invasive, although it is less abundant in the Master Plan area. Moderately invasive species have substantial and apparent ecological impacts; in the Master Plan area these species include alkali Russian thistle and Italian thistle (Cal-IPC, 2015). To prevent the introduction new non-native, invasive species, and to control their spread across the Master Plan area, specific “weed control measures” would be implemented as mitigation for the Master Plan. These are further discussed in Section 4.7.3 below.

Water Purification Facilities

As the WPF is currently planned, pipelines for the WPF groundwater replenishment facilities may cross Calabazas Creek, San Tomas Aquino Creek, Saratoga Creek, and Los Gatos Creek. Open water, wetland, and riparian habitats associated with these streams potentially fall under the jurisdiction of the USACE, San Francisco RWQCB, and/or CDFW. However, CWA Section 10 waters and areas subject to BCDC jurisdiction are not present in the groundwater replenishment facilities area due to the absence of tidal (or historically tidal) waters. A large suite of non-native, invasive species, including Himalayan blackberry (Rubus armeniacus), yellow star thistle (Centauria solstitialis), ripgut brome (Bromus diandrus), and Italian thistle, also occur in the WPF groundwater replenishment facilities area.

To determine potentially occurring sensitive habitats in the groundwater replenishment facilities area, Rarefind (CNDDB, 2015) was queried for natural communities of special concern documented in Santa Clara County. Six sensitive habitats occur in Santa Clara County, including: (1) north central coast California roach/stickleback/steelhead stream, (2) north central coast steelhead/sculpin stream, (3) northern coastal salt marsh, (4) serpentine bunchgrass, (5) sycamore alluvial woodland, and (6) valley oak woodland. However, none of these sensitive habitats have been documented in the groundwater replenishment facilities area, which is situated within a dense urban matrix of developed lands. Further, the WPF groundwater replenishment facilities would not cross sections of streams that have tidal influence; thus, sensitive habitats associated with tidal aquatic areas (such as northern coastal salt marsh) would not be adversely affected by the WPF groundwater replenishment facilities.

4.7.1.5 Special-Status Species

CEQA requires assessment of the effects of a project on species that are protected by state, federal, or local governments as “threatened, rare, or endangered;” such species are typically described as “special-status species.” For the purpose of the environmental review of the Master Plan and WPF, special-status species are defined as described below. Impacts on these species are regulated by some of the federal, state, and local laws and ordinances described in Section 4.7.2 below.
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For purposes of this analysis, plants species are considered “special-status” plants if they are:

- Listed under the Federal Endangered Species Act (FESA) as threatened, endangered, proposed threatened, proposed endangered, or a candidate species,
- Listed under the California Endangered Species Act (CESA) as threatened, endangered, rare, or a candidate species, or
- Listed in the California Native Plant Society’s (CNPS) Rare and Endangered Plant Inventory with a California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, 3, or 4.6

For purposes of this analysis, animal species are considered “special-status” animals if they are:

- Listed under FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate species,
- Listed under CESA as threatened, endangered, or a candidate threatened or endangered species,
- Designated by the CDFW as a California species of special concern, or
- Listed in the Fish and Game Code as fully protected species (fully protected birds are provided in Section 3511, mammals in Section 4700, reptiles and amphibians in Section 5050, and fish in Section 5515).

Prior to conducting reconnaissance surveys in July and August 2015, EIR biologists reviewed project plans and the project description; aerial imagery (Google Inc., 2015); USGS topographic maps; and other relevant scientific literature, including technical databases and resource agency reports, in order to assess the current distribution of special-status plants and animals in the project vicinity. For the purposes of this analysis, the general “vicinity” of the Master Plan area is defined as the five-mile radius surrounding the WPCP borders (shown in Chapter 3, Project Description, Figure 3-2). The general vicinity of the WPF groundwater facilities area is also defined as the five-mile radius around the groundwater replenishment facilities area shown in Figure 3-12. In addition, the authors reviewed several other sources of information on special-status species compiled for other projects in the vicinity.7

**Master Plan**

To develop a list of special-status species that may occur in the Master Plan region,8 EIR biologists reviewed information from Rarefind (CNDDB, 2015); the CNPS Rare and Endangered Inventory (2015); and miscellaneous information available through the USFWS, the National Marine Fisheries Service (NMFS), the CDFW, and the Habitat Plan (ICF, 2012). Special-status plant species with a CRPR of 1, 2, 3, and 4 were reviewed. Because quadrangle-level records are not maintained for

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6 The CNPS ranking system is described in more detail below under Master Plan Special-status Plants.
7 Includes the Sunnyvale WPCP Preliminary Delineation of Wetlands and Other Waters (HTH, 2014a), Sunnyvale WPCP Master Plan and Primary Treatment Facility Design Biological Resources Constraints and Opportunities Report (HTH, 2014b), and the SCVWD Sunnyvale East and West Channels Flood Protection Project Final Environmental Impact Report (Horizon, 2013).
8 Defined as the nine USGS 7.5-minute quadrangles containing or surrounding the Master Plan area.
CRPR 3 and 4 species, the authors also conducted a search of the CNPS (2015) records for CRPR 3 and 4 species occurring in Santa Clara County. From all of these sources, the authors created initial lists of special-status species considered for potential occurrence within the Master Plan area. The list was then refined by analyzing the suitable habitat types, edaphic conditions (e.g. serpentine and/or alkaline soils), and elevation range required by each species as well as the locations of documented populations relative to the boundaries of the Master Plan area. Figures 4.7-4 and Figure 4.7-5 show areas where special-status species are known to have occurred previously based on records of CNDDB-mapped special-status plants and animals in the Master Plan vicinity.

Special-status Plants

The CNPS, a non-governmental conservation organization, has developed the CRPR system for species of concern. Vascular plants included in the system are defined as follows:

- Rank 1A: Plants considered extinct.
- Rank 1B: Plants rare, threatened, or endangered in California and elsewhere.
- Rank 2A: Plants considered extinct in California and elsewhere.
- Rank 2B: Plants rare, threatened, or endangered in California but more common elsewhere.
- Rank 3: Plants about which more information is needed - review list.
- Rank 4: Plants of limited distribution - watch list.

These rankings are further described by the following threat code extensions:

- 1: seriously endangered in California.
- 2: fairly endangered in California.
- 3: not very endangered in California

The CNPS (2015) and CNDDB (2015) identify 79 special-status plant species as potentially occurring in the Master Plan region. There are CNDDB records in the Master Plan vicinity for brittlescale (Atriplex depressa, CRPR 1B.2), Congdon’s tarplant (Centromadia parryi ssp. congonii, CRPR 1B.1), Contra Costa goldfields (Lasthenia conjugens, Federally Endangered and CRPR 1B.1), Hoover’s button celery (Eryngium aristulatum var. hooveri, CRPR 1B.1), Point Reyes bird’s beak (Chloropyron maritimum ssp. palustre, 1B.2), prostrate navarretia (Navaretia prostrata, CRPR 1B.1), robust spineflower (Chorizanthe robusta var. robusta, Federally Endangered and CRPR 1B.1), San Joaquin spearscale (Extriplex joaquiniana, CRPR 1B.1), and saline clover (Trifolium hydrophilum, CRPR 1B.2). With the exception of Congdon’s tarplant, which occurs at Sunnyvale Baylands Park, the majority of these records document extirpated populations. The only records for extant populations of other special-status plants document species occurring in the Pacific Commons Preserve, to the north of the Master Plan area in Fremont. The preserve is a restored area that supports a mosaic of vernal pools, connecting swales, and native grasslands that provide suitable habitat for these special-status plant species.

Comparable habitat types do not exist within the Master Plan area; therefore, only one special-status plant species, Congdon’s tarplant, has the potential to occur within the Master Plan area. Appendix D lists the other 78 plant species that were considered for potential occurrence in the Master Plan area, along with the basis for the determination that they are absent.
LEGEND

Proposed for Restoration
Following Decommissioning
Areas Proposed for Improvements
Under the Master Plan

5-mile Radius

CNDDB Records

Animals

Specific Location
Approximate Location
General Area

0 Miles
1.4 Miles

SOURCE: Esri, USGS, California Department of Fish and Wildlife's Biogeographic Data Branch (BDB).

Figure 4.7-5
CNDDB Wildlife Occurrences
4.7 Biological Resources

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Congdon’s tarplant is an annual herb in the composite family (Asteraceae) that is endemic to California. It has a variable blooming period extending from May through November. Congdon’s tarplant occurs in valley and foothill grassland habitat, floodplains, and swales, particularly those with alkaline substrates; and in disturbed areas with non-native grasses such as various species of wild oats, ripgut brome (*Bromus diandrus*), Italian ryegrass (*Festuca perennis*), and seaside barley (*Hordeum marinum*) (CNDDB, 2015; CNPS, 2015; Baldwin et al., 2012; and SCVWD, 2011). Congdon’s tarplant occurs in Alameda, Contra Costa, Monterey, San Luis Obispo, San Mateo, Santa Clara, Santa Cruz, and Solano counties (CNDDB, 2015). A large population of this species occurs at Sunnyvale Baylands Park, approximately one mile east of the WPCP, and ruderal habitats and upper marsh areas in the Master Plan area provide potentially suitable habitat for this species’ occurrence in the Master Plan area.

**Special-status Animals**

Table 4.7-2 presents the potential for occurrence and legal status of special-status wildlife species known to occur or potentially occurring in the general vicinity of the Master Plan area.

Expanded descriptions are provided below for those species included in Table 4.7-2 that are known to breed or could potentially breed in the Master Plan area or its vicinity; that occur fairly commonly as non-breeders in the Master Plan area (and thus could potentially be substantially affected by activities that occur with implementation of the Master Plan or WPF); and/or that are of particular concern to regulatory agencies.9

**Federal or State Endangered and Threatened Species**

**Green Sturgeon** (*Acipenser medirostris*). Federal Listing Status (southern Distinct Population Segment [southern DPS]) Threatened; State Listing Status: Species of Special Concern. All of the San Francisco Bay, including tidal and estuarine areas associated with the Bay, is designated as critical habitat. Therefore, all tidally influenced areas in the Master Plan area have been designated as critical habitat.

Green sturgeons range from Ensenada, Mexico, to the Bering Sea and occur widely in accessible estuarine habitat (Adams et al., 2007). Within the southern DPS, spawning occurs predominantly in the upper Sacramento River (Adams et al. 2007), and South Bay tributaries do not provide suitable spawning habitat. San Francisco Bay (Beamesderfer et al., 2007, Kelly et al., 2007), but the species appears to be relatively rare in the South Bay. Of 74 green sturgeon captured in the San Francisco Estuary between 1980 and 2011 as part of monitoring conducted by CDFW, only 4 were collected in the South Bay (K. Hieb, pers. comm.). To date, the only confirmed record of green sturgeon south of the Dumbarton Bridge is that of an acoustic-tagged individual detected at receivers positioned along the Dumbarton Railroad Bridge (ECORP, 2012). No green sturgeons were detected by receivers farther south, and the green sturgeon has not been documented within Santa Clara County.

---

9 These include the green sturgeon, longfin smelt, Central California Coast steelhead, western pond turtle, California Ridgway’s rail, California black rail, western snowy plover, northern harrier, white-tailed kite, peregrine falcon, burrowing owl, loggerhead shrike, San Francisco common yellowthroat, Alameda song sparrow, tricolored blackbird, salt marsh harvest mouse, salt marsh wandering shrew, and western red bat.
### TABLE 4.7-2

**SPECIAL-STATUS ANIMAL SPECIES, THEIR STATUS, HABITAT DESCRIPTION, AND POTENTIAL FOR OCCURRENCE IN THE MASTER PLAN AND WATER PURIFICATION FACILITIES AREAS**

<table>
<thead>
<tr>
<th>Name</th>
<th>ESA/CESA Status</th>
<th>Habitat</th>
<th>Potential for Occurrence in Master Plan and Water Purification Facilities Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Federal or State Endangered, Threatened, or Candidate Species</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green sturgeon <em>(Acipenser medirostris)</em></td>
<td>FT, CSSC</td>
<td>Spawns in large river systems such as the Sacramento River; forages in nearshore oceanic waters, bays, and estuaries.</td>
<td><strong>Master Plan: May be Present.</strong> Known to occur in the San Francisco Bay, though it apparently occurs only as a rare, nonbreeding visitor to the South Bay. Unlikely to occur in the channels in the Master Plan area due to their narrow, freshwater/brackish nature and lack of suitable spawning conditions. Foraging juvenile and adult green sturgeon could enter the lower portions of the Moffett Channel and/or Sunnyvale West Channel from the open waters of the Bay, although only infrequently and in low numbers, if at all. All tidally influenced areas of the San Francisco Bay, up to the elevation of mean high water, have been designated as critical habitat for this species (NMFS, 2009). <strong>WPF: Absent.</strong> No suitable habitat for green sturgeon is present, due to the lack of tidal influence or large rivers. Therefore, this species is determined to be absent from the WPF groundwater replenishment facilities area.</td>
</tr>
<tr>
<td>Longfin smelt <em>(Spirinchus thaleichthys)</em></td>
<td>FC, ST, CSSC</td>
<td>Spawns in fresh water in the San Francisco Bay; occurs year-round in the South Bay.</td>
<td><strong>Master Plan: May be Present.</strong> Has been reported in the South Bay year-round (Wernette, 2000), and has been collected in Alviso Slough (EDAW, Inc., 2007a). However, fish sampling in Coyote Slough and other ponds in the region has detected the species only in January and March, suggesting that it may be absent during the summer (Hobbs et al., 2012). May be present in the tidal reaches of sloughs in the South Bay, including Moffett Channel and the Sunnyvale West Channel. Although freshwater input could provide suitable spawning habitat for longfin smelt in the tidal reaches of the Sunnyvale West Channel, the degraded conditions of potential spawning substrate in the channel likely preclude use of this channel for spawning. Thus, if the species is present at all, it is likely present only from late fall into early spring. <strong>WPF: Absent.</strong> No suitable spawning habitat for longfin smelt is present in the freshwater creeks within the WPF groundwater replenishment facilities area, and suitable tidal habitat is not present. Therefore, this species is determined to be absent.</td>
</tr>
<tr>
<td>Central California Coast steelhead <em>(Oncorhynchus mykiss)</em></td>
<td>FT</td>
<td>Cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats.</td>
<td><strong>Master Plan: May be Present.</strong> This species has not been documented in the Sunnyvale West Channel or Moffett Channel, and no suitable spawning habitat is present within the Master Plan area. However, small numbers of stray steelhead associated with spawning streams elsewhere in the South Bay could occasionally wander into tidal portions of the Master Plan area to forage. Because no suitable spawning habitat for steelhead occurs within the Master Plan area, this species is not expected to occur regularly, if it occurs at all. Critical habitat for this species within the Master Plan area includes the Moffett Channel and the tidally influenced portions of the Sunnyvale West Channel (NMFS, 2005).</td>
</tr>
</tbody>
</table>
4.7 Biological Resources

<table>
<thead>
<tr>
<th>Name</th>
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<tr>
<td><strong>Federal or State Endangered, Threatened, or Candidate Species (cont.)</strong></td>
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<td></td>
</tr>
<tr>
<td>WPF: Absent. This species has been documented to spawn in Los Gatos Creek downstream of the WPF groundwater replenishment facilities area. However, a 35-foot drop structure located downstream of Camden Avenue and San Thomas Expressway that is an impediment to salmonid passage. The new lateral pipeline from the WPF main pipeline would serve the McGlincey Ponds (east of Los Gatos) via Camden Avenue. Therefore, construction associated with the WPF would occur upstream of the Camden Avenue drop structure where steelhead do not occur. In addition, steelhead do not occur elsewhere in the WPF groundwater replenishment facilities area.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>California tiger salamander ((Ambystoma californiense))</td>
<td>FT, ST</td>
<td>Vernal or temporary pools in annual grasslands or open woodlands.</td>
<td><strong>Master Plan and WPF: Absent.</strong> Populations located on the Valley floor have been extirpated due to habitat loss, and the species is now considered absent from the majority of the valley floor, including the Master Plan area (HTH, 1999a, 2012b; SCVWD, 2011). No recent records of California tiger salamanders are located within 4.5 miles of the WPCP or within the WPF groundwater replenishment facilities area (CNDDB, 2015), and the Habitat Plan does not map any potential tiger salamander habitat within the portion of the WPF area that is located within the Habitat Plan boundary. Therefore, this species is determined to be absent from the Master Plan and WPF areas.</td>
</tr>
<tr>
<td>California red-legged frog ((Rana draytonii))</td>
<td>FT, CSSC</td>
<td>Streams, freshwater pools, and ponds with emergent or overhanging vegetation.</td>
<td><strong>Master Plan and WPF: Absent.</strong> This species has been extirpated from the majority of the region, including the entire urbanized Valley floor, due to development, the alteration of hydrology of its aquatic habitats, and the introduction of non-native predators such as non-native fishes and bullfrogs (HTH, 1997; SCVWD, 2011). No recent records of California red-legged frogs are located within 5 miles of the WPCP or within the WPF groundwater replenishment facilities area (CNDDB, 2015). Although the Habitat Plan maps the portions of Calabazas, San Tomas Aquino, Los Gatos, and Saratoga Creeks within the Habitat Plan boundary as potential breeding habitat for this species, there is no evidence that this species occurs anywhere in the vicinity. Thus, California red-legged frogs are determined to be absent.</td>
</tr>
<tr>
<td>San Francisco garter snake ((Thamnophis sirtalis tetrataenia))</td>
<td>FE, SE, SP</td>
<td>Streams, freshwater pools, and ponds with emergent vegetation and native amphibians.</td>
<td><strong>Master Plan and WPF: Absent.</strong> No recent records of San Francisco garter snake are located within 5 miles of the WPCP, and no recent records occur in the WPF groundwater replenishment facilities area (CNDDB, 2015), as both areas are outside this subspecies' range. Thus, this species is determined to be absent.</td>
</tr>
<tr>
<td>Bank swallow ((Riparia riparia))</td>
<td>ST</td>
<td>Colonial nester on vertical banks or cliffs with fine-textured soils near water.</td>
<td><strong>Master Plan and WPF: Absent.</strong> There are no recent nesting records of bank swallow from Santa Clara County, and no suitable nesting habitat occurs in or near the Master Plan or WPF groundwater replenishment facilities areas. Occurs in the region only as a rare migrant (Bousman, 2007a).</td>
</tr>
</tbody>
</table>
TABLE 4.7-2 (Continued)
SPECIAL-STATUS ANIMAL SPECIES, THEIR STATUS, HABITAT DESCRIPTION, AND POTENTIAL FOR OCCURRENCE IN THE MASTER PLAN AND WATER PURIFICATION FACILITIES AREAS

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<td></td>
</tr>
<tr>
<td>Bald eagle (<strong>Haliaeetus leucocephalus</strong>)</td>
<td>SE, SP</td>
<td>Occurs mainly along seacoasts, rivers, and lakes; nests in tall trees or in cliffs, occasionally on electrical towers. Feeds mostly on fish.</td>
<td><strong>Master Plan and WPF: Absent.</strong> Has been recorded nesting in the region only at inland reservoirs; very rare along the San Francisco Bay edge and in developed portions of the valley. No suitable nesting or foraging habitat for bald eagle in the Master Plan area or the WPF groundwater replenishment facilities area. Therefore, this species is determined to be absent.</td>
</tr>
<tr>
<td>Swainson’s hawk (<strong>Buteo swainsoni</strong>)</td>
<td>ST</td>
<td>Nests in trees surrounded by extensive marshland or agricultural land that provides foraging habitat.</td>
<td><strong>Master Plan and WPF: Absent.</strong> Suitable nesting and foraging habitat is absent, and thus, this species is determined to be absent.</td>
</tr>
<tr>
<td>California Ridgway’s rail (<strong>Rallus obsoletus obsoletus</strong>)</td>
<td>FE, SE, SP</td>
<td>Salt marsh habitat dominated by pickleweed and cordgrass.</td>
<td><strong>Master Plan: May be Present.</strong> Suitable foraging habitat for the Ridgway’s rail occurs in the portion of Moffett Channel that lies within the Master Plan area (HTH, 2011b). Ridgway’s rails have been recorded in marsh habitat in the Master Plan area during the nonbreeding season in Moffett Channel, and they have nested near the Master Plan area along Guadalupe Slough (eBird, 2015; South Bay Birds list-serve, 2015). Because Ridgway’s rails typically nest in broader marshes with well-developed tidal channels (conditions that are absent from the Master Plan area), they are not expected to nest within the Master Plan area boundary. The Sunnyvale West Channel upstream of Moffett Channel lacks suitable marsh habitat for use by this species. <strong>WPF: Absent.</strong> Suitable salt marsh habitat for this species is not present in the WPF groundwater replenishment facilities area. Therefore, Ridgway’s rail is determined to be absent.</td>
</tr>
<tr>
<td>California black rail (<strong>Laterallus jamaicensis coturniculus</strong>)</td>
<td>ST, SP</td>
<td>Breeds in fresh, brackish, and tidal salt marsh.</td>
<td><strong>Master Plan: May be Present.</strong> Occurs in the South Bay primarily as a scarce winter visitor. Suitable habitat for nonbreeding California black rails in the Master Plan area occurs in tidal marshes in Moffett Channel (HTH, 2011b). The species has recently been recorded during the breeding season in Triangle Marsh along Coyote Slough approximately 2.6 miles northeast of the WPCP and along lower and mid-Alviso Slough (South Bay Birds list-serve, 2015), suggesting that this species nests in some areas in the South Bay. However, this species has not been recorded in the Master Plan area despite intensive coverage of the area by birders, and therefore it may not be summering in the Master Plan vicinity as it has recently done along nearby Alviso Slough. Few individuals, if any, are expected to forage at the Master Plan area at any given time.</td>
</tr>
</tbody>
</table>
TABLE 4.7-2 (Continued)
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<td></td>
<td></td>
<td>WPF: <strong>Absent.</strong> No suitable habitat is present in the WPF groundwater replenishment facilities area. Therefore, this species is determined to be absent.</td>
</tr>
<tr>
<td>Western snowy plover <strong>(Charadrius alexandrinus nivosus)</strong></td>
<td>FT, CSSC</td>
<td>Sandy beaches on marine and estuarine shores and salt pans in San Francisco Bay saline managed ponds.</td>
<td><strong>Master Plan: Absent as Breeder.</strong> Although western snowy plovers are known to nest in nearby managed ponds northeast of the Master Plan area (Bousman, 2007b), they are not expected to nest in Ponds 1 and 2 or elsewhere within or adjacent to the Master Plan area due to a lack of suitable habitat. Human recreational activity on the levees of Ponds 1 and 2 precludes nesting on levees by this sensitive species. Limited foraging habitat is present in Ponds 1 and 2 when periodic water drawdowns for tertiary treatment expose mud flats along the edges, although this species typically forages in broader expanses of exposed sediment than are present in the Master Plan area during such drawdowns. Therefore, this species is expected to occur in the Master Plan area only as an occasional forager, if at all. <strong>WPF: Absent.</strong> No suitable nesting, roosting, or foraging habitat for western snowy plover is present in the WPF groundwater replenishment facilities area. This species is determined to be absent.</td>
</tr>
<tr>
<td>California least tern <strong>(Sterna antillarum browni)</strong></td>
<td>FE, SE, SP</td>
<td>Nests along the coast on bare or sparsely vegetated, flat substrates. In the South Bay, nests in salt pans and on an old airport runway. Forages for fish in open waters.</td>
<td><strong>Master Plan and WPF: Likely Absent.</strong> The South Bay is an important post-breeding staging area for least terns to gather before migration, and the species has been observed foraging in the Master Plan vicinity. The preferred post-breeding staging area is currently just north of Moffett Federal Airfield (Moffett Field), approximately 1 mile west of the Master Plan area. Least terns forage primarily in managed ponds and over open water of the San Francisco Bay, and thus are not expected to forage in the Sunnyvale West Channel or Moffett Channel. This species does not nest in the Master Plan area, as the area also lacks high-quality nesting or roosting habitat, and human recreational disturbance and vegetation preclude the use of levees adjacent to the oxidation ponds as regular roost sites. Further, no least tern roosts have been observed in the Master Plan area and no suitable habitat is present in the WPF groundwater replenishment facilities area. Therefore, this species is determined to be absent, or if present, occurs only as an occasional forager (e.g., in the oxidation ponds).</td>
</tr>
<tr>
<td>Salt marsh harvest mouse <strong>(Reithrodontomys raviventris)</strong></td>
<td>FE, SE, SP</td>
<td>Salt marsh habitat dominated by common pickleweed.</td>
<td><strong>Master Plan: May be Present.</strong> Salt marsh harvest mice have been documented in nearby marshes (HTH, 1991; USFWS and California Department of Fish and Game [CDFG], 2007), and suitable (although low-quality) habitat for this species occurs in the Master Plan area along the edge of the Moffett Channel. Salt marsh harvest mice have not been documented to move more than 16.4 feet over bare ground (Bias, 1994; Geissel et al., 1988). Thus, they are unlikely to move regularly</td>
</tr>
</tbody>
</table>
### TABLE 4.7-2 (Continued)
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<tr>
<td>from occupied areas along Moffett Channel into the narrow strip of pickleweed marsh along the Cargill Channel, and there is thus a relatively low probability of occurrence along the Cargill Channel.</td>
<td></td>
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<tr>
<td><strong>WPF: Absent.</strong> No suitable salt marsh habitat is present in the WPF groundwater replenishment facilities area. Therefore, salt marsh harvest mouse is determined to be absent.</td>
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<tr>
<td><strong>California Species of Special Concern</strong></td>
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<td></td>
</tr>
<tr>
<td>Central Valley fall-run Chinook salmon <em>(Oncorhynchus tshawytscha)</em></td>
<td>CSSC</td>
<td>Cool rivers and large streams that reach the ocean and that have shallow, partly shaded pools, riffles, and runs.</td>
<td><strong>Master Plan: May be Present.</strong> Chinook are not known to spawn in any creeks flowing into the Master Plan area, and suitable spawning habitat is absent. However, as with the steelhead, small numbers of stray individuals associated with spawning streams elsewhere in the South Bay could occasionally wander onto tidal portions of the Master Plan area (such as the lower Sunnyvale West Channel) to forage. Because no suitable spawning habitat for steelhead occurs within the Master Plan area or along upstream portions of streams that flow through the Master Plan area, this species is not expected to occur regularly, if it occurs at all.</td>
</tr>
<tr>
<td>Foothill yellow-legged frog <em>(Rana boylii)</em></td>
<td>CSSC</td>
<td>Partially shaded shallow streams and riffles with a rocky substrate. Occurs in a variety of habitats in coast ranges.</td>
<td><strong>Master Plan and WPF: Absent.</strong> Although this species occurs in less urbanized areas of Santa Clara County, it has disappeared from farmed and urbanized areas as well as many of the perennial streams below major reservoirs (HTH, 1999b). Although the Habitat Plan maps the portions of Calabazas, San Tomas Aquino, Los Gatos, and Saratoga Creeks within the Habitat Plan boundary as potential primary habitat for this species, there is no evidence that it occurs anywhere in the vicinity, as suitable habitat for foothill yellow-legged frogs is absent from the Master Plan and WPF groundwater replenishment facilities area.</td>
</tr>
<tr>
<td>Western pond turtle <em>(Actinemys marmorata)</em></td>
<td>CSSC</td>
<td>Permanent or nearly permanent water in a variety of habitats.</td>
<td><strong>Master Plan and WPF: May be Present.</strong> Although breeding populations have been extirpated from most agricultural and urbanized areas in the region, individuals of this long-lived species still occur in urban streams and ponds in the Santa Clara Valley. A small population is known to be present in nontidal channels west of the Master Plan area. Therefore, small numbers of western pond turtles may</td>
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</table>
### TABLE 4.7-2 (Continued)

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<td><strong>California Species of Special Concern (cont.)</strong></td>
<td></td>
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<td>occur in the Sunnyvale West Channel and the small channels to the west (HTH, 2012a). Similarly, small numbers of western pond turtles may occur in streams in the WPF groundwater replenishment facilities area, although no western pond turtles occur in the existing recharge basins in the Los Gatos Groundwater Recharge System proposed to be used as groundwater replenishment facilities (HTH, 2012a).</td>
</tr>
<tr>
<td>Coast horned lizard ( (Phrynosoma blainvillii) )</td>
<td>CSSC</td>
<td>Open habitats with sandy, loosely textured soils, such as chaparral, coastal scrub, annual grassland, and clearings in riparian woodlands with the presence of native harvester ants ( (Pogonomyrmex barbatus) ).</td>
<td><strong>Master Plan and WPF: Absent.</strong> Suitable habitat is not present in the Master Plan or WPF groundwater replenishment facilities areas.</td>
</tr>
<tr>
<td>Black skimmer ( (Rynchops niger) )</td>
<td>CSSC (nesting)</td>
<td>Nests on abandoned levees and islands in saline managed ponds and marshes.</td>
<td><strong>Master Plan and WPF: Absent as Breeder.</strong> Black skimmers have nested in the South Bay since 1994, including areas near the Master Plan on islands in saline managed ponds in the Alviso Slough area (Bousman 2007c). However, recreational use of the levees around the oxidation ponds precludes their use for nesting. Further, despite the high level of both professional and recreational birdwatching conducted in the Master Plan vicinity, the species has not been documented nesting in the Master Plan or WPF areas. Black skimmers may forage occasionally in the oxidation ponds or Cargill Channel, but they are not expected to nest in either the Master Plan or WPF groundwater replenishment facilities areas, or to occur at all in the WPF area.</td>
</tr>
<tr>
<td>Northern harrier ( (Circus cyaneus) )</td>
<td>CSSC (nesting)</td>
<td>Nests in marshes and moist fields, forages over open areas.</td>
<td><strong>Master Plan and WPF: Present.</strong> Suitable nesting and foraging habitat for one or two pairs of northern harriers is present in marshes along the lower part of Moffett Channel and Guadalupe Slough adjacent to (but not in) the Master Plan area. This species may forage year-round along levees in the Master Plan area and on the former landfill adjacent to the WPCP and the northernmost portion of the WPF groundwater replenishment facilities area. Suitable nesting and foraging habitat is absent from other parts of the WPF groundwater replenishment facilities area.</td>
</tr>
<tr>
<td>Long-eared owl ( (Asio otus) )</td>
<td>CSSC (nesting)</td>
<td>Riparian bottomlands with tall, dense willows and cottonwood stands (also dense live oak and California Bay along upland streams); forages primarily in adjacent open areas.</td>
<td><strong>Master Plan and WPF: Absent.</strong> This species is a rare resident and occasional winter visitor in Santa Clara County (Bousman, 2007d). Suitable nesting and foraging habitat for long-eared owls is not present in the Master Plan area or the WPF groundwater replenishment facilities area.</td>
</tr>
</tbody>
</table>
### TABLE 4.7-2 (Continued)
SPECIAL-STATUS ANIMAL SPECIES, THEIR STATUS, HABITAT DESCRIPTION, AND POTENTIAL FOR OCCURRENCE IN THE MASTER PLAN AND WATER PURIFICATION FACILITIES AREAS

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<tbody>
<tr>
<td>Short-eared owl (<em>Asio flammeus</em>)</td>
<td>CSSC (nesting)</td>
<td>Nests in marshes and moist fields, forages over open areas.</td>
<td><strong>Master Plan and WPF: Absent as Breeder.</strong> This species has been recorded nesting in the region only in the Palo Alto Flood Control Basin, though it has not been confirmed nesting there since the 1970s. Suitable nesting habitat is not present in the Master Plan area or the WPF groundwater replenishment facilities area. Therefore, nesting short-eared owls are determined to be absent. Small numbers of wintering birds may occasionally forage in marshes along Guadalupe Slough and lower Moffett Channel, adjacent to the Master Plan area.</td>
</tr>
<tr>
<td>Burrowing owl (<em>Athene cunicularia</em>)</td>
<td>CSSC</td>
<td>Nests and roosts in open grasslands and ruderal habitats with suitable burrows, usually those made by California ground squirrels.</td>
<td><strong>Master Plan and WPF: May be Present.</strong> During surveys conducted in the winter of 2007 to 2008 (EDAW, Inc., 2008), a burrowing owl was detected on the west bank of the Sunnyvale East Channel approximately 0.5 mile east of the Master Plan area and a burrow with evidence of owl use (i.e., whitewash) was documented along the Sunnyvale West Channel upstream of the Master Plan area. During 2012 and early 2013, one to two burrowing owls were reported on the landfill just west of the Sunnyvale West Channel, north of Caribbean Drive (South Bay Birds List-serve, 2015). Monitoring efforts conducted in 2013 and 2014 at the WPCP main plant and the former landfill areas detected two active burrowing owl burrows on the East Hill and a third active burrow on Recycle Hill approximately 200 feet north of the proposed Bay Trail parking relocation area (Chromczak, 2014; Chromczak pers. comm., 2015). However, these owls were only present during the nonbreeding season. The CNDDB (2015) includes two records of burrowing owls along the northernmost portion of the Sunnyvale West Channel and adjacent to the Master Plan area and two additional records in the vicinity of the WPF groundwater replenishment facilities area at Mission College and Peterson Middle School in Cupertino. Ruderal habitats on the former Sunnyvale Landfill provide suitable nesting, roosting, and foraging habitat for one or two pairs of burrowing owls, and California ground squirrel burrows are prevalent in these habitats. However, there is a low probability that individual burrowing owls would roost in burrows along channel levees, such as surrounding Ponds 1 and 2, within the Master Plan area due to the limited extent of ruderal habitat on these levees and the frequency of human use. Away from the former Sunnyvale Landfill areas, no suitable habitat is present for this species in the WPF groundwater replenishment facilities area.</td>
</tr>
<tr>
<td>Vaux’s swift (<em>Chaetura vauxi</em>)</td>
<td>CSSC (nesting)</td>
<td>Nests in snags in coastal coniferous forests or, occasionally, in chimneys; forages aerially.</td>
<td><strong>Master Plan: Absent as Breeder.</strong> In Santa Clara County, small numbers nest in chimneys in the foothills from Los Altos to the Campbell/Los Gatos area. Although it occurs regularly as a migrant and post-breeding dispersant in the Master Plan area, often foraging over the main plant and oxidation ponds, this species does not nest near the Master Plan area.</td>
</tr>
</tbody>
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### TABLE 4.7-2 (Continued)
SPECIAL-STATUS ANIMAL SPECIES, THEIR STATUS, HABITAT DESCRIPTION, AND POTENTIAL FOR OCCURRENCE IN THE MASTER PLAN AND WATER PURIFICATION FACILITIES AREAS

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<tr>
<td><strong>Loggerhead shrike</strong> (<em>Lanius ludovicianus</em>)</td>
<td>CSSC (nesting)</td>
<td>Nests in tall shrubs and dense trees; forages in grasslands, marshes, and ruderal habitats.</td>
<td><strong>Master Plan and WPF: May be Present.</strong> Nests in a number of locations in the region where open grassland, ruderal, or agricultural habitat with scattered brush, chaparral, or trees provide perches and nesting sites (Bousman, 2007e), though populations have declined in recent years as suitable habitat has been increasingly developed. Ruderal habitats in the Master Plan area, particularly those on the former Sunnyvale Landfill, provide suitable nesting and foraging habitat for one or two pairs, but the species is not expected to occur elsewhere in the Master Plan area due to the limited extent of open habitat. Away from the former Sunnyvale Landfill, no suitable habitat is present within the WPF groundwater replenishment facilities area.</td>
</tr>
<tr>
<td><strong>Yellow warbler</strong> (<em>Setophaga petechia</em>)</td>
<td>CSSC (nesting)</td>
<td>Nests in riparian woodlands.</td>
<td><strong>Master Plan: Absent as Breeder.</strong> Prefers riparian corridors with adjacent open space (rather than in heavily developed areas) and an overstory of mature cottonwoods and sycamores, a midstory of box elders and willows, and a substantial shrub understory (Bousman, 2007f). Limited riparian habitats near the Master Plan area support a reduced understory and abundant non-native vegetation, and are immediately adjacent to development. The dense vegetation along the levees adjacent to the WPCP and channels, as well as trees and shrubs around the main plant, provide suitable foraging habitat for this species, and yellow warblers forage in these areas during migration. Thus, suitable nesting habitat for yellow warblers is absent from the Master Plan area, but this species occurs in the Master Plan area as a common migrant during the spring and fall. <strong>WPF: May be Present.</strong> Yellow warblers may nest in the WPF groundwater replenishment facilities area where suitable riparian woodlands are present, possibly along Los Gatos Creek. However, the potential for this species to nest in the WPF groundwater replenishment facilities area is low because the area is highly developed and the majority of riparian woodland on the valley floor is limited in extent and lacks a mature overstory or substantial understory. This species is present primarily as a migrant.</td>
</tr>
<tr>
<td><strong>San Francisco common yellowthroat</strong> (<em>Geothlypis trichas sinuosa</em>)</td>
<td>CSSC</td>
<td>Nests in herbaceous vegetation, usually in wetlands or moist floodplains.</td>
<td><strong>Master Plan: Present.</strong> Common yellowthroats nesting in the Master Plan area are of the special-status subspecies <em>sinuosa</em> (San Francisco Bay Bird Observatory [SFBBO], 2012). The greatest proportion of nesting records in the region occur within brackish and freshwater marshes near...</td>
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</tr>
<tr>
<td>Yellow-breasted chat</td>
<td>CSSC (nesting)</td>
<td>Nests in dense stands of willow and other riparian habitat.</td>
<td>Master Plan and WPF: Absent. This species is a rare breeder, and only slightly more regular transient, in willow-dominated riparian habitats in the region. However, suitably large, dense stands of riparian habitat are not present in the Master Plan or WPF groundwater replenishment facilities areas. Therefore, nesting yellow-breasted chats are determined to be absent.</td>
</tr>
<tr>
<td>(Icteria virens)</td>
<td></td>
<td></td>
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<tr>
<td>Alameda song sparrow</td>
<td>CSSC</td>
<td>Nests in salt marsh, primarily in marsh gumplant and cordgrass along channels.</td>
<td>Master Plan: Present. The pusillula subspecies of song sparrow is endemic to Central and South San Francisco Bay. In the Master Plan area, this subspecies occurs in the taller vegetation found along tidal sloughs. The location of the interface between populations of the Alameda song sparrow (pusillula) and the common race that breeds in freshwater riparian habitats in the region (gouldii) is not definitive due to difficulties distinguishing these subspecies in the field (Rottenborn, 2007a). Song sparrows nesting along the Moffett Channel and lower portions of the Sunnyvale West Channel may belong to the pusillula or gouldii subspecies, or may be intergrades between the two (SFBBO, 2012). However, pusillula is presumed to be the subspecies that is numerous in brackish marsh habitat in the Master Plan area. It nests in tidal brackish marsh habitats along the Moffett Channel and Sunnyvale West Channel, and in lower numbers along the Cargill Channel and patches of marsh vegetation around the oxidation ponds. WPF: Absent. No suitable salt marsh habitat is present in the WPF groundwater replenishment facilities area. Therefore, this species is determined to be absent.</td>
</tr>
<tr>
<td>(Melospiza melodia pusillula)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Grasshopper sparrow</td>
<td>CSSC (nesting)</td>
<td>Nests and forages in grasslands, meadows, fallow fields, and pastures.</td>
<td>Master Plan and WPF: Absent. Known to occur in the region primarily in grasslands and less frequently disturbed agricultural habitats, mostly in the foothills. Suitably extensive grasslands are not present in the Master Plan area or the WPF groundwater replenishment facilities area.</td>
</tr>
<tr>
<td>(Ammodramus savannarum)</td>
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<tr>
<td>Bryant's savannah sparrow (Passerculus sandaichensis alaudinus)</td>
<td>CSSC</td>
<td>Nests in pickleweed dominant salt marsh and adjacent ruderal habitat.</td>
<td>Master Plan and WPF: Absent as Breeder. In the South San Francisco Bay, nests primarily in short pickleweed-dominated portions of diked/muted tidal salt marsh habitat and in adjacent ruderal habitats (Rottenborn, 2007b). This species may nest in low numbers east of the Master Plan area around the edge of SCVWD Pond A4 and in broader marshes along lower Moffett Channel and Guadalupe Slough adjacent to (but not in) the Master Plan area. During the nonbreeding season, <em>alaudinus</em> and other savannah sparrow subspecies may forage in open areas adjacent to or within the Master Plan area. However, no suitable nesting habitat for savannah sparrow occurs within the Master Plan or WPF groundwater replenishment facilities areas.</td>
</tr>
<tr>
<td>Tricolored blackbird (Agelaius tricolor)</td>
<td>CSSC</td>
<td>Nests near fresh water in dense emergent vegetation.</td>
<td>Master Plan and WPF: Absent as Breeder. Typically nests in extensive stands of tall emergent herbaceous vegetation in non-tidal freshwater marshes and ponds; the emergent vegetation around the oxidation ponds is not sufficiently extensive to support this species. Not known to nest in tidal habitats in the South Bay, and has not been recorded nesting in the Master Plan area. The species is known to forage in the Master Plan area during the nonbreeding season, particularly along the lower Sunnyvale West Channel and on the former landfill, is known to roost in marshes along Moffett Channel and the lower Sunnyvale West Channel, and may forage and/or roost during the nonbreeding season along freshwater streams in the WPF groundwater replenishment facilities area. However, nesting colonies of tricolored blackbird are absent.</td>
</tr>
<tr>
<td>Salt marsh wandering shrew (Sorex vagrans halicoetes)</td>
<td>CSSC</td>
<td>Medium to high marsh 6 to 8 feet above sea level with abundant driftwood and common pickleweed.</td>
<td>Master Plan: May be Present. Formerly more widely distributed in the San Francisco Bay Area, this small insectivorous mammal is now confined to salt marshes of the South Bay (Findley, 1955). Salt marsh wandering shrews occur most often in medium to high wet tidal marsh (6 to 8 feet above sea level), with abundant driftwood and other debris for cover (Shellhammer, 2000). Typically, they are found in fairly tall pickleweed, in which they build nests. No high-quality pickleweed habitat for salt marsh wandering shrews occurs within the Master Plan area. However, this species may occur in the same areas described above for the salt marsh harvest mouse.</td>
</tr>
<tr>
<td>Pallid bat (Antrozous pallidus)</td>
<td>CSSC</td>
<td>Forages over many habitats; roosts in caves, rock outcrops, buildings, and hollow trees.</td>
<td>Master Plan and WPF: Absent as Breeder. Historically, pallid bats were likely present in a number of locations throughout the region, but their populations have declined in recent decades. No known maternity colonies are present within the Master Plan area or the WPF groundwater</td>
</tr>
</tbody>
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Sunnyvale Water Pollution Control Plant Master Plan  
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ESA | 120457  
February 2016
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<td></td>
<td>replenishment facilities, and this species has been extirpated as a breeder from urban areas close to the Bay, as in the case of the Master Plan and WPF groundwater replenishment facilities areas. There is a low probability that the species occurs in the Master Plan or WPF vicinities at all due to urbanization; however, individuals from more remote colonies could potentially forage within the Master Plan area over open habitats or freshwater streams in the WPF groundwater replenishment facilities area on rare occasions.</td>
</tr>
<tr>
<td>Townsend’s big-eared bat (<em>Corynorhinus townsendii</em>)</td>
<td>CSSC</td>
<td>Roosts in caves and mine tunnels, and occasionally in deep crevices in trees such as redwoods or in abandoned buildings, in a variety of habitats.</td>
<td><strong>Master Plan and WPF: Absent.</strong> No known extant populations occur on the Santa Clara Valley floor, and no breeding or roosting sites are known from the Master Plan area or the WPF groundwater replenishment facilities area. Suitable breeding habitat for this species is not present and the species is determined to be absent.</td>
</tr>
<tr>
<td>Western red bat (<em>Lasiurus blossevillii</em>)</td>
<td>CSSC</td>
<td>Roosts in foliage in forest or woodlands, especially in or near riparian habitat.</td>
<td><strong>Master Plan and WPF: Absent as Breeder.</strong> Occurs as a migrant and winter resident, but does not breed in the region. Small numbers may occasionally roost in the foliage of trees virtually anywhere in the Master Plan or WPF groundwater replenishment facilities areas.</td>
</tr>
<tr>
<td>San Francisco dusky-footed woodrat (<em>Neotoma fuscipes ancenstes</em>)</td>
<td>CSSC</td>
<td>Nests in a variety of habitats including riparian areas, oak woodlands, and scrub.</td>
<td><strong>Master Plan: Absent.</strong> Currently, with the exception of records along Coyote Creek and along the edges of the Valley, San Francisco dusky-footed woodrats are not known to occur in the more urbanized portions of Santa Clara County (HTH, 2010) such as the Master Plan area. Thus, this species is determined to be absent from the Master Plan area. <strong>WPF: May be Present.</strong> Suitable habitat for dusky-footed woodrats occurs in areas of thick, shrubby vegetation along freshwater streams and creeks in the WPF groundwater replenishment facilities area; however, San Francisco dusky-footed woodrats are not known to occur in the more urbanized portions of Santa Clara County (HTH, 2010). Small numbers of individuals may be present in the uppermost reaches of streams in the WPF groundwater replenishment facilities area, such as Saratoga Creek and Los Gatos Creek.</td>
</tr>
<tr>
<td>American badger (<em>Taxidea taxus</em>)</td>
<td>CSSC</td>
<td>Burrows in grasslands and occasionally in infrequently disked agricultural areas.</td>
<td><strong>Master Plan and WPF: Absent.</strong> Known to occur in the region primarily in extensive grasslands and less frequently disturbed agricultural habitats, mostly in the foothills. Suitably extensive grasslands are not present in the Master Plan area or the WPF groundwater replenishment facilities area.</td>
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<td><strong>State Fully Protected Species</strong></td>
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</tr>
<tr>
<td>California brown pelican <em>(Pelecanus occidentalis californicus)</em></td>
<td>SP (nesting colony and communal roosts)</td>
<td>Undisturbed islands near estuarine, marine, subtidal, and marine pelagic waters.</td>
<td><strong>Master Plan and WPF: Absent as Breeder.</strong> Brown pelicans are uncommon nonbreeding visitors in Santa Clara County. The species is known to occur in the open-water habitat of SCVWD Pond A4 (SCVWD, 2000) and likely to occur in Ponds 1 and 2, which it uses for foraging and likely for bathing and loafing; however, it occurs only in low numbers due to the relatively low densities of fish present compared to other available habitat in the South Bay. The Sunnyvale West Channel and the reach of Moffett Channel in the Master Plan area are too narrow to provide suitable foraging habitat for brown pelicans. Suitable habitat for the species is not present in the WPF groundwater replenishment facilities area.</td>
</tr>
<tr>
<td>American peregrine falcon <em>(Falco peregrinus anatum)</em></td>
<td>SP</td>
<td>Forages in many habitats; nests on cliffs and tall bridges and buildings.</td>
<td><strong>Master Plan and WPF: Absent as Breeder.</strong> The closest locations within the Master Plan vicinity where peregrines have nested are in old raven and hawk nests on electrical transmission towers within managed ponds in the Mountain View area and on the wind tunnel at Moffett Field, approximately 1.5 miles northwest and 1.9 miles southwest of Pond 2, respectively. The species is not known to nest in the immediate Master Plan or WPF groundwater replenishment facilities areas, but peregrines nesting elsewhere in the South Bay, as well as migrants and wintering birds, forage regularly on waterfowl at Ponds 1 and 2 and may occur occasionally in the WPF groundwater replenishment facilities area as nonbreeders.</td>
</tr>
<tr>
<td>Golden eagle <em>(Aquila chrysaetos)</em></td>
<td>SP</td>
<td>Breeds on cliffs or in large trees (rarely on electrical towers), forages in open areas.</td>
<td><strong>Master Plan and WPF: Absent as Breeder.</strong> Suitable nesting habitat is not present in the Master Plan area or the WPF groundwater replenishment facilities. An immature golden eagle was observed along the canals west of the WPCP in January 2012 (South Bay Birds List-serve, 2015). This species is expected to forage in open ruderal habitats adjacent to the Master Plan area (such as on the former landfill) or the WPF groundwater replenishment facilities area only infrequently, based on the limited number of recorded occurrences in this area by birders.</td>
</tr>
<tr>
<td>White-tailed kite <em>(Elanus leucurus)</em></td>
<td>SP</td>
<td>Nests in tall shrubs and trees, forages in grasslands, marshes, and ruderal habitats.</td>
<td><strong>Master Plan and WPF: May be Present.</strong> In the vicinity of the Master Plan area, the species is known to nest along the northern edge of Santa Clara County throughout the open areas edging the San Francisco Bay (Bousman, 2007h). There are a number of records from Moffett Field to the west and some from Sunnyvale Baylands Park to the east (South Bay Birds List-serve, 2015). Suitable trees for nesting and open ruderal habitat for foraging makes the former landfill adjacent to the Master Plan area suitable for nesting by up to one pair, although the species is not likely to nest within the Master Plan boundary. In the WPF area, this species is unlikely to occur away from the Sunnyvale Landfill due to the urbanization in the remainder of the WPF groundwater replenishment facilities area.</td>
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<tr>
<td>Ringtail</td>
<td>SP</td>
<td>Cavities in rock outcrops and talus slopes, as well as hollows in trees, logs, and snags that occur in riparian habitats and dense woodlands, usually in close proximity to water.</td>
<td><strong>Master Plan and WPF: Absent.</strong> This species occurs in less urbanized settings in the South Bay; however, there are no records from the Master Plan area or the WPF groundwater replenishment facilities area. Suitable riparian and dense woodland habitats are absent from the Master Plan and WPF areas, and the species is not expected to occur.</td>
</tr>
<tr>
<td>Pacific harbor seal</td>
<td>MMPA</td>
<td>Throughout the northern Atlantic and Pacific Oceans along coastal waters, river mouths, and bays</td>
<td><strong>Master Plan and WPF: Absent.</strong> Permanent resident of San Francisco Bay. Primary haul-out sites in San Francisco Bay include Mowry Slough (243 seals in 1999), 5 miles northwest of the Master Plan area. Suitable haul-out sites for harbor seals are present in the region in the tidal reaches of sloughs in the South Bay area. However, no pupping sites or major haul-out sites are present within the Master Plan area or its vicinity. No suitable haul-out sites, pupping sites, or foraging habitat for harbor seal are present within the Master Plan area or WPF groundwater replenishment facilities areas. Therefore, this species is determined to be absent.</td>
</tr>
</tbody>
</table>

**KEY TO STATUS ABBREVIATIONS:**
- Federally Endangered (FE);
- Federally Threatened (FT);
- Federal Candidate (FC);
- State Endangered (SE);
- State Threatened (ST);
- State Protected (SP);
- California Species of Special Concern (CSSC);
- Species Protected by the Marine Mammal Protection Act (MMPA).

**NOTES:**
- The willow flycatcher (*Empidonax traillii*) formerly nested commonly in riparian habitats on the Santa Clara Valley floor, but local populations were extirpated by the late 1960s. This species still occurs as an uncommon migrant in the Master Plan area, between wintering areas in Mexico and breeding areas to the north (Unitt, 1987; Hunter et al., 2005). However, migrant willow flycatchers occurring in the Master Plan area are likely from breeding populations outside the state, and, thus, would not be individuals from the state-listed California population or the federally listed subspecies *extimus* that resides in riparian habitat of southern California (Unitt, 1987). Therefore this species is not included for more detailed discussion in this table.

- In addition, the following special-status species are considered California species of special concern when nesting but occur in the South Bay region only as nonbreeding transients, foragers, or migrants: black tern (*Chlidonias niger*), redhead (*Aythya americana*), Barrow’s goldeneye (*Bucephala islandica*), common loon (*Gavia immer*), and American white pelican (*Pelecanus erythrorhynchos*). Because these species are only considered species of special concern when nesting, they are not “special-status species” when they occur as nonbreeding visitors to the Master Plan or WPF groundwater replenishment facilities areas, and they are not included in this table.

- Discussion of occurrence in the WPF area refers to the WPF groundwater replenishment facilities area; occurrence in the vicinity of WPF at the WPCP would be as described for the Master Plan.
Green sturgeon could potentially occur in the tidal reaches of the Sunnyvale West Channel and Moffett Channel infrequently and/or in low numbers. This species is not expected to spawn in the Master Plan area because the channels are narrow, highly engineered, and lack suitable spawning habitat. If green sturgeon occur in the Master Plan vicinity, they are most likely to occur in Guadalupe Slough, and possibly deeper portions of Moffett Channel.

**Longfin Smelt** (*Spirinchus thaleichthys*). Federal Listing Status (Bay-Delta DPS): Candidate; State Listing Status: Threatened. The longfin smelt is found as far north as Prince William Sound, Alaska. The Bay-Delta DPS, which represents the southernmost population of the species, occurs in the San Francisco Bay. The longfin smelt was declared a threatened species under the CESA in March 2009. In 2012, the USFWS determined that listing of the Bay-Delta DPS was warranted but precluded by higher priority actions, and the species is thus considered a candidate for federal listing under the FESA (USFWS, 2012).

Suisun and San Pablo Bays, where salinity generally ranges from 2 to 20 parts per thousand, support the most abundant populations of nonbreeding longfin smelt in the San Francisco Bay area. Spawning occurs in fresh water in the upper end of the San Francisco Bay and in the Sacramento-San Joaquin Delta (Wernette 2000). Longfin smelt occur in the South Bay year-round as pre-spawning adults and yearling juveniles (Wernette, 2000), and have been collected in the Alviso area and in Alviso Slough (EDAW, Inc. 2007a).

In the Master Plan area, freshwater input from the Sunnyvale West Channel could attract maturing adults. However, because this channel is relatively short, engineered, confined by steeply banked levees, and contains very limited sand and gravel spawning substrate, the suitability of the Sunnyvale West Channel for spawning is limited and it is highly unlikely that longfin smelt spawn within the Master Plan area. Rare, stray juvenile and adult longfin smelt may forage in tidally influenced portions of the Master Plan area, where refugia with cooler temperatures occur. However, high water temperatures may be a stressor (Stanford et al., 2009), and Moyle (2002) reported that the species is not commonly found in waters above 70° F. Thus, during the summer and fall, elevated water temperatures may create conditions too warm to support longfin smelt in the Master Plan area.

**Central California Coast Steelhead** (*Oncorhynchus mykiss*). Federal Listing Status: Threatened; State Listing Status: None. The steelhead is an anadromous form of rainbow trout that migrates upstream from the ocean to spawn in late fall or early winter, when flows are sufficient to allow them to reach suitable habitat in far upstream areas. In the South Bay, adults typically migrate to spawning areas from late December through early April, and both adults and smolts migrate downstream from February through May. Steelhead typically spawn in gravel substrates located in clear, cool, perennial sections of relatively undisturbed streams, with dense canopy cover that provides shade, woody debris, and organic matter. Steelhead usually cannot survive long in pools or streams with water temperatures above 70° F; however, they can use warmer habitats if adequate food is available. Steelhead populations have declined due to degradation of spawning and rearing habitat, introduction of barriers to upstream migration, over-harvesting by recreational fisheries, and reduction in winter flows due to damming and spring flows due to water diversion.
NMFS has categorized steelhead into Distinct Population Segments (DPSs). The Central California Coast DPS consists of all runs from the Russian River in Sonoma County south to Aptos Creek in Santa Cruz County, including all steelhead spawning in streams that flow into the San Francisco Bay. Within northern Santa Clara County, designated Critical Habitat includes tidal areas of the San Francisco Bay and accessible reaches of Upper Penitencia, Coyote, Stevens, San Francisquito, and Los Trancos creeks, as well as the Arroyo Aguague and the Guadalupe River upstream nearly to its confluence with Los Gatos Creek.

Steelhead historically occurred more abundantly in streams throughout the region but they are now relatively rare due to urbanization, the presence of barriers to movement, and loss of spawning and rearing habitat (Leidy et al., 2003). The species has not been documented in the Sunnyvale West Channel, Cargill Channel, or Moffett Channel, and no spawning habitat is present within, or along streams upstream from, the Master Plan area. Further, the Sunnyvale West Channel is a linear flood-control facility, the majority of which is highly engineered, containing no suitable spawning habitat for steelhead. It is possible that individuals from other South Bay streams may occasionally wander into the Master Plan area (e.g., Moffett Channel) and could potentially occur in the tidal reaches of the Sunnyvale West Channel infrequently and/or in low numbers.

**California Ridgway’s Rail** (*Rallus obsoletus obsoletus*). Federal Listing Status: Endangered; State Listing Status: Endangered and Fully Protected. The California Ridgway’s rail is a secretive marsh bird that is currently endemic to marshes of the San Francisco Bay. It formerly bred at several other locations, including Humboldt Bay (Humboldt County), Elkhorn Slough (Monterey County), and Morro Bay (San Luis Obispo County), but is now extirpated from all sites outside of the San Francisco Bay (Harding-Smith, 1993). California Ridgway’s rails nest in salt and brackish marshes along the edge of the Bay, and are most abundant in extensive salt marshes and brackish marshes dominated by Pacific cordgrass (*Spartina alterniflora*), pickleweed, and marsh gumplant (*Grindelia stricta*) and that contain complex networks of tidal channels (Harvey, 1980). Shrubby areas adjacent to or within these marshes are also important for predator avoidance at high tides.

Since the mid-1800s, about 90 percent of the San Francisco Bay’s marshlands have been eliminated through filling, diking, or conversion to salt evaporation ponds. As a result, the California Ridgway’s rail lost most of its former habitat, and its population declined severely. The subspecies was listed as endangered by the USFWS in 1970 (USFWS, 1970) and by the State of California in 1971. In 2013, the USFWS adopted a joint recovery plan for tidal marsh ecosystems in northern and central California that includes the salt marsh harvest mouse and the California Ridgway’s rail (USFWS, 2013). Critical habitat has not been proposed for the California Ridgway’s rail.

Although California Ridgway’s rails are typically found in tidal salt marshes dominated by Pacific cordgrass, they have also been documented in brackish marshes in the South Bay, including in nearly pure stands of alkali bulrush along Guadalupe Slough in 1990 and 1991 (HTH 1990a, 1990b, 1991). These California Ridgway’s rails were detected in Guadalupe Slough during studies conducted by HTH for compliance with discharge permits issued to the City of Sunnyvale. These surveys occurred during the 1990 and 1991 breeding seasons for Ridgway’s
rails (April – May). In 1990, a single pair of Ridgway’s rails was detected at the confluence of Moffett Channel and Guadalupe Slough and in a marsh along Guadalupe Slough directly north of the Pond 1. In 1991, three pairs of Ridgway’s rails were detected in these same areas, and two more Ridgway’s rails were detected north of SCVWD Pond A4.

Based on current site conditions, there is limited suitable habitat for California Ridgway’s rails in portions of Moffett Channel and Cargill Channel that are within the Master Plan area (Figure 4.7-1). Brackish tidal marsh in central and upper Moffett Channel could be used by Ridgway’s rails for foraging, at least occasionally, and Ridgway’s rails may even use the freshwater marsh at the southern (upstream) extent of Moffett Channel for foraging on rare occasions. The small strip of salt marsh in Cargill Channel would not be used for foraging because it is not connected to tidal marsh. The Sunnyvale West Channel upstream of Moffett Channel does not provide suitable marsh habitat for use by this species. This channel is narrow with steep banks and lacks suitable vegetative cover (e.g., Pacific cordgrass, alkali bulrush).

Because California Ridgway’s rails typically breed in broader marshes with well-developed tidal channels, conditions that are absent from the immediate Master Plan area, Ridgway’s rails are not expected to breed within the Master Plan area. However, this species may still breed in the broader area of marsh immediately north and northeast of the Master Plan area, within Guadalupe Slough.

**California Black Rail** (*Laterallus jamaicensis coturniculus*). Federal Listing Status: None; State Listing Status: Threatened and Fully Protected. The California black rail is a small rail that inhabits a variety of marsh types. California black rails are most abundant in extensive tidal marshes with some freshwater input (Evens et al., 1991). They nest primarily in pickleweed-dominated marshes with patches or borders of bulrushes, often near the mouths of creeks. Black rails build nests in tall grasses or marsh vegetation during spring, and lay about six eggs. Nests are usually constructed of pickleweed, and are placed directly on the ground or slightly above ground in vegetation. Black rails feed on terrestrial insects, aquatic invertebrates, and possibly seeds (Trulio and Evens, 2000).

The California black rail reportedly nested in the Alviso area in the early 1900s (Wheelock, 1916), but until recently it was known in the South Bay primarily as a non-breeder. Black rails were detected in Triangle Marsh, approximately 2.3 miles northeast of the Master Plan area in 2012. Fourteen of these rails were tracked throughout the 2012 nesting season in Triangle Marsh, suggesting that the species nests there (Hall, 2013). During the 2013, 2014, and 2015 breeding seasons, black rails have been detected calling along lower and mid-Alviso Slough (South Bay Birds List-serve, 2015), as close as 0.6 mile from the Master Plan area. These records suggest that small numbers of black rails have recently begun oversummering, and likely breeding, in the South Bay.

The scarcity of nesting black rails in the South Bay is presumably a result of habitat loss. Tidal marsh habitat has been lost, but perhaps more important to winter survival is the loss of high-tide refugia. Upland transition habitat, both on natural levees within marshes and on landward
edges of marshes, has been lost as a result of fill for development, and reductions in marsh size and resulting reductions in natural levees along higher-order channels. Predation of black rails by egrets, herons, gulls, and harriers has been observed in these marshes during winter high tides, as rails are forced into the open by rising water. The importance of this predation on a population level, especially in light of impacts on high tide refugia, is unknown, but it may be a significant factor in the extirpation (until recently) of nesting populations of the species from the South Bay.

Suitable nonbreeding habitat for California black rails in the Master Plan area includes the brackish marshes in Moffett Channel. The brackish marsh vegetation (e.g., alkali bulrush) along the Moffett Channel levee and the freshwater marsh habitat at the southern extent of Moffett Channel are suitable for foraging black rails. The salt marsh vegetation in the Cargill Channel is not expected to be used by this species due to its lack of connectivity to tidal marsh. Due to this species’ recent appearance in the South Bay throughout the breeding season, there is some potential for black rails to breed in the broader marshes along the Moffett Channel and Guadalupe Slough. However, no black rails have been heard calling in the marshes around the Sunnyvale WPCP by birders, as they have along Alviso Slough, despite frequent coverage of the WPCP by birders (South Bay Birds List-serve, 2015).

Western Snowy Plover (*Charadrius alexandrinus nivosus*). Federal Listing Status: Threatened; State Listing Status: Species of Special Concern. The snowy plover is a small shorebird that occurs on almost every continent. On the Pacific coast, snowy plovers nest on sandy beaches and salt panne habitat from Washington to Baja Mexico. Because they nest during the summer, primarily on beaches in a temperate climate, snowy plovers are susceptible to nest disturbance and other negative interactions with humans. Much of their nesting habitat, particularly in southern California, has been lost to development and high human use. In addition, introduced predators, especially the non-native red fox, have had dramatic effects on snowy plover nesting success. In response to severe population declines, the USFWS listed the Pacific coast population of the western snowy plover as threatened in 1993. Critical habitat was designated for this population in 1999 (USFWS, 1999a), and a revised recovery plan was released in 2007 (USFWS, 2007). None of the breeding sites within the San Francisco Bay are considered critical habitat.

In the South San Francisco Bay, snowy plovers nest on low, barren to sparsely vegetated saline managed pond levees and islands, at pond edges, and on salt panne areas of dry ponds (Page et al., 2000), and preferentially use light-colored substrates such as salt flats (Marriott, 2003). Nesting areas are located near water, where prey (usually brine flies and other insects) are abundant. In some areas, snowy plovers nest within dry saline managed ponds; in other areas where ponds typically hold water through the summer, nests are located primarily on levees. In Santa Clara County, the distribution of snowy plovers is restricted to a few managed ponds and other impoundments along the immediate edge of San Francisco Bay (Bousman, 2007b).

In the vicinity of the Master Plan area, snowy plovers have nested primarily in managed ponds and New Chicago Marsh in Alviso (Armstrong, 1976; Ryan and Parkin, 1998), north and northeast of the Master Plan area, and in seasonal impoundments near Crittenden Marsh north of Moffett Field, approximately 1.1 miles west of the Master Plan area (South Bay Birds List-serve, 2015).
Snowy plovers may forage along the margins of Ponds 1 and 2 when water levels are low and muddy edges are present, but exposed sediment in these ponds is usually not sufficiently extensive to be used by this species, which has not been definitively recorded there. Therefore, if snowy plovers occur in the Master Plan area at all, they would occur as very infrequent foragers; owing to a lack of suitable habitat and absence of records at this well-birded location, this species is not expected to nest in the Master Plan area.

**Tricolored Blackbird** (*Agelaius tricolor*). Federal Listing Status: None; State Listing Status: Endangered. Tricolored blackbirds are found primarily in the Central Valley and in central and southern coastal areas of California. This species is considered a California species of special concern (at its nesting colonies) due to concerns over the loss of wetland habitats in the state. The tricolored blackbird is highly colonial in its nesting habits, and forms dense nesting colonies that, in some parts of the Central Valley, may consist of up to tens of thousands of pairs. This species typically nests in tall, dense, stands of cattails or tules, but also nests in blackberry, wild rose bushes, and tall herbs. Nesting colonies are usually located near fresh water. Tricolored blackbirds form large, often multi-species flocks during the nonbreeding period and range more widely than during the nesting season.

Suitable nesting habitat for the tricolored blackbird is not present in the Master Plan area, as this species is not known to breed in tidal marsh in the South Bay, where all ostensibly suitable emergent vegetation is located. However, the species is known to forage in the area during the nonbreeding season, particularly along the lower Sunnyvale West Channel and on the closed landfill, and to roost in marshes along Moffett Channel and the Sunnyvale West Channel.

**Salt Marsh Harvest Mouse** (*Reithrodontomys raviventris*). Federal Listing Status: Endangered; State Listing Status: Endangered and Fully Protected. The salt marsh harvest mouse is a rodent endemic to the salt and brackish marshes, and adjacent tidally influenced areas, of the San Francisco Bay estuary. At present, the distribution of the northern subspecies, *R. raviventris halicoetes*, occurs along Suisun and San Pablo Bays north of Point Pinole in Contra Costa County, and Point Pedro in Marin County. The southern subspecies, *R. raviventris raviventris*, is found in marshes in Corte Madera, Richmond, and South Bay mostly south of the San Mateo Bridge.

The salt marsh harvest mouse has evolved to a life in tidal marshes and depends mainly on dense pickleweeds as their primary cover and food source, although it may utilize a broader source of food and cover that includes saltgrass (*Distichlis spicata*) and other vegetation typically found in the salt and brackish marshes of this region. In natural systems, salt marsh harvest mice can be found in the middle tidal marsh and upland transition zones. Upland refugia are an essential habitat component during high tide events, when the marsh plain is inundated, as salt marsh harvest mice are highly dependent on cover. The harvest mouse does not burrow, but it has been noted that the northern subspecies may build nests of loose grasses. Salt marsh harvest mice are capable of breeding year-round, although most reproductive activity likely occurs between March and November, with a peak in mid-summer.
Cover-dependent salt marsh harvest mice are unlikely to move long distances over bare areas, and thus, isolation of suitable habitat may lead to genetic isolation of populations or local extinctions. While they are known to swim well, especially in comparison with western harvest mice, they have not been documented to move more than 13.1 to 16.4 feet across water or more than 16.4 feet over bare ground (Bias, 1994; Geissel et al., 1988).

The salt marsh harvest mouse population has declined substantially in recent decades due to habitat loss, degradation, and fragmentation, and populations are currently very low. Critical habitat has not been designated for this species. In 2013, the USFWS adopted a joint recovery plan for tidal marsh ecosystems in northern and central California that includes the salt marsh harvest mouse and the California Ridgway’s rail (USFWS, 2013).

To date no small mammal trapping studies have been conducted within the Master Plan area. However, in 1990 HTH conducted a focused salt marsh harvest mouse trapping effort in Guadalupe Slough downstream of the Master Plan area (HTH, 1991). Two locations in the slough were sampled: one site close to the mouth of the slough and one site directly north of Pond 1. Two salt marsh harvest mice were captured at the sample site near the mouth of Guadalupe Slough with an overall trapping effort of 1200 trap nights. Pickleweed was the dominant plant species at both capture locations, consisting of 100 percent cover in the marsh plain site and 50 percent cover on the levee. No salt marsh harvest mice were captured at the sample site closer to Pond 1, despite an effort of 1400 trap nights. However, the marsh plain at this site was considered too low to safely trap without inundation at high tide, thus all the traps were placed at higher elevation on the levee. This site had low pickleweed cover and generally consisted of more perennial peppergrass, alkali bulrush, alkali heath (Frankenia salina), and a mix of other species compared to the sample site near the mouth of the slough. In addition, HTH salt marsh harvest mouse expert Howard Shellhammer, Ph.D., conducted a focused field assessment of salt marsh harvest mouse habitat suitability in the Sunnyvale Channels project area on 8 November 2010 (HTH, 2011b). Portions of the Sunnyvale West Channel were surveyed, as well as the brackish tidal marshes on the exterior of SCVWD Pond A4 and the pickleweed-dominated vegetation in Moffett Channel and Guadalupe Slough, where harvest mice are most likely to occur.

The marshes on the exterior of Pond 1 are dominated by mostly open stands of alkali bulrush, perennial peppergrass and California bulrush with some patches of pickleweed in the marsh plain. Although there have been few salt marsh harvest mouse studies conducted in this type of brackish marsh, HTH conducted a trapping study in a brackish marsh near Newby Island in South San Francisco Bay in 2006 where the marsh was dominated by mature alkali bulrush consisting of deep, thick layer of thatch (HTH, 2007). Several salt marsh harvest mice were captured in this marsh, resulting in a capture rate approximately half that of a nearby salt marsh dominated by thick pickleweed, the vegetation normally associated with this species in the South Bay. Because salt marsh harvest mice are now known to occur in this brackish marsh vegetation in the South Bay, the brackish tidal marsh in the Master Plan area (i.e., the tidal marsh in Moffett Channel) was considered potential salt marsh harvest mouse habitat based on Dr. Shellhammer’s field review (HTH, 2011b). However, the potential for salt marsh harvest mice to occur in these marshes is still fairly low. These marshes are generally sparse in terms of physiognomy (i.e.,
vegetation structure) and do not contain dense thatch that harvest mice have been documented using. Also, the alkali bulrush is mixed in areas with cattail, California bulrush, perennial peppergrass, and other vegetation not known to support salt marsh harvest mice, resulting in fragmentation of suitable vegetation.

Suitable brackish marsh habitat for the salt marsh harvest mouse is present in Moffett Channel and portions of Sunnyvale West Channel below the effluent discharge site, where alkali bulrush is present; salt marsh harvest mice are not expected to occur in areas dominated by pure stands of cattail and California bulrush farther upstream along the Sunnyvale West Channel. In addition, a very narrow strip of potential salt marsh habitat is present in the Master Plan area within the Cargill Channel where pickleweed is the dominant vegetation, although this habitat is disconnected from suitable habitat along the Moffett Channel by the exposed levee road. Because salt marsh harvest mice have been captured in Guadalupe Slough north of the Master Plan area, and because the marsh habitats in Moffett Channel and Cargill Channel contain stands of vegetation that this species has been documented using, the presence of salt marsh harvest mice (albeit in very low numbers) in the Master Plan area cannot be dismissed.

**California Species of Special Concern**

**Central Valley Fall-run Chinook Salmon** (*Oncorhynchus tshawytscha*). Federal Listing Status: None; State Listing Status: Species of Special Concern. Like the steelhead, the Chinook salmon is an anadromous salmonid. Populations of Pacific salmon have been categorized into Evolutionarily Significant Units (ESUs) by the NMFS; an ESU represents a population of Pacific salmon that is reproductively isolated from other conspecific populations, and is recognized as a distinct evolutionary component of the species. The Central Valley Fall-run ESU represents a population of Chinook salmon that migrate from the ocean to spawning streams in late fall and begin spawning in beds of coarse river gravels between October and December. Populations of fall-run Chinook salmon have suffered the effects of over-fishing by commercial fisheries, degradation of spawning and rearing habitat, added barriers to upstream migration, and reductions in winter flows due to damming. Approximately 40 to 50 percent of spawning and rearing habitats in Central Valley streams have been lost or degraded. Chinook salmon generally spawn in cool waters providing incubation temperatures no warmer than 55°F. Compared to steelhead, Chinook salmon are more likely to spawn in coarse gravels located lower in the watershed.

Chinook salmon did not historically spawn in streams flowing into South San Francisco Bay. However, small numbers of fall-run Chinook salmon have been found in several such streams within the project region since the mid-1980s including Coyote Creek, Los Gatos Creek, and the Guadalupe River (Leidy et al., 2003). Genetic analysis, timing of spawning, and the detection of coded wire-tagged hatchery fish in the project region suggests that these fish are derived from Central Valley fall-run stock (Garcia-Rossi and Hedgecock, 2002), likely hatchery releases, and do not represent a native run.

Chinook salmon have not been documented in the Sunnyvale West Channel, Moffett Channel, or Guadalupe Slough, nor do they spawn in channels upstream from the Master Plan area. In
addition, the Sunnyvale West Channel is a narrow, linear flood-control facility, the majority of which is highly engineered, containing no suitable spawning habitat for Chinook. It is possible that occasional strays from Central Valley streams may occur in the portion of Sunnyvale West Channel in the Master Plan area as they do in other South Bay creeks, but they are expected to occur there irregularly at best and would occur only in tidal areas.

**Western Pond Turtle** (*Actinemys marmorata*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The western pond turtle occurs in ponds, streams, and other wetland habitats in the Pacific slope drainages of California and northern Baja California, Mexico (Bury and Germano, 2008). The central California population was historically present in most drainages on the Pacific slope (Jennings and Hayes, 1994), but streambed alterations and other sources of habitat destruction, exacerbated by frequent drought events, have caused substantial population declines throughout most of the species’ range (Stebbins, 2003). Ponds or slack-water pools with suitable basking sites (such as logs) are an important habitat component for this species, and western pond turtles do not occur commonly along high-gradient streams. Females lay eggs in upland habitats, in clay or silty soils in unshaded (often south-facing) areas up to 0.25 mile from aquatic habitat (Jennings and Hayes, 1994). Juveniles feed and grow in shallow aquatic habitats (often creeks) with emergent vegetation and ample invertebrate prey. Nesting habitat is typically found within 600 feet of aquatic habitat (Jennings and Hayes, 1994), but if no suitable nesting habitat can be found close by, adults may travel overland considerable distances to nest. Threats to the western pond turtle include impacts on nesting habitat from agricultural and grazing activities, human development of habitat, and increased predation pressure from native and non-native predators as a result of human-induced landscape changes.

In the Master Plan vicinity, the western pond turtle has been documented within the non-tidal portion of Moffett Channel and associated drainage channels west of the Sunnyvale West Channel (EDAW, Inc., 2007b). Thus, the species could occur in the Master Plan area in the Sunnyvale West Channel and in the non-tidal channels immediately to the west of the levee along the west side of the Sunnyvale West Channel. It is possible that pond turtles nest along levees in the Master Plan area, albeit in low numbers. However, the cumulative stressors of urbanization, including release of non-native turtles, predation and harassment by pets and non-native mammals, capture by humans, degradation of water quality, loss of upland nesting habitat due to development, and the construction of barriers between creeks and nesting areas, have reduced western pond turtle populations, and pond turtle numbers are expected to be low in the Master Plan area.

**Northern Harrier** (*Circus cyaneus*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The northern harrier nests in marshes and grasslands, usually those with tall vegetation and moisture sufficient to inhibit accessibility of nest sites to predators. This species forages, primarily on small mammals and birds, in a variety of open grassland, ruderal, and agricultural habitats.

Northern harriers breed in small numbers in more extensive patches of tidal marsh habitat close to San Francisco Bay, including marshes along the lower reaches of Moffett Channel and
Guadalupe Slough, adjacent to the Master Plan area. Thus, one or two pairs could potentially breed in marshes east and north of the oxidation ponds. However, harriers are not expected to nest in the narrow strips of marsh along Moffett Channel within the Master Plan area itself. In addition, this species is expected to forage along levees and on the closed landfill adjacent to the Master Plan area.

**Burrowing Owl** (*Athene cunicularia*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The burrowing owl is a small, terrestrial owl of open country. These owls prefer annual and perennial grasslands, typically with sparse or nonexistent tree or shrub canopies. In California, burrowing owls are found in close association with California ground squirrels; owls use the abandoned burrows of ground squirrels for shelter and nesting. The nesting season as recognized by the CDFW (2012) runs from February 1 through August 31. After nesting is completed, adult owls may remain in their nesting burrows or in nearby burrows, or they may migrate; young birds disperse across the landscape from 0.1 miles to 35 miles from their natal burrows (Rosenberg et al., 2007). Burrowing owl populations have declined substantially in the San Francisco Bay area in recent years, with declines estimated at 4-6 percent annually (Rosenberg et al., 2007).

Burrowing owls occur year-round in the Santa Clara Valley (Trulio 2007), and are commonly present in open, agricultural or grassland areas with active squirrel burrows. Burrowing owls also exhibit strong site fidelity, and may return to a nesting site and attempt to nest even after the site has been developed. The ruderal habitat within the Master Plan area, particularly that surrounding the City of Sunnyvale Recycle Center and WPCP provides, provides suitable breeding habitat for burrowing owls. However, this species is increasingly disappearing from “infill” locations on the urban valley floor.

The CNDDB (2015) includes two records of burrowing owls along the northern-most portion of the Sunnyvale West Channel. In addition, Debra Chromczak, researcher and consultant for the City of Sunnyvale, has conducted annual monitoring of burrowing owls at the main plant and closed landfill areas since 2000. Numbers of burrowing owls using the Sunnyvale WPCP and landfill vicinity have consistently declined since 2000, and the species last nested in this area in 2004. However, small numbers of wintering owls have consistently been recorded on the landfill. In 2013, Chromczak observed two owls on the East Hill of the closed landfill (Chromczak, 2014). In 2014, one owl was observed on the East Hill, adjacent to the Sunnyvale East Channel, and a second owl was observed on the Recycle Hill, adjacent to the Sunnyvale West Channel (Chromczak pers. comm., 2015). The active burrow on the west slope of Recycle Hill is located approximately 200 feet north of the proposed Bay Trail parking area on Caribbean Drive. Ruderal habitats in the Master Plan area, particularly those on the closed landfill adjacent to the main plant, provide suitable breeding, roosting, and foraging habitat for one or two pairs. Breeding is unlikely due to the absence of breeding owls in the vicinity since 2004, although the City intends to enhance habitat in some areas on the closed landfill for burrowing owls, which would increase the likelihood of breeding (HTH, 2015).
**Loggerhead Shrike** (*Lanius ludovicianus*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The loggerhead shrike is a predatory songbird associated with open habitats interspersed with shrubs, trees, poles, fences, or other perches from which it can hunt (Yosef, 1996). Nests are built in densely foliated shrubs or trees, often containing thorns, which offer protection from predators and upon which prey items are impaled. The breeding season for loggerhead shrikes may begin as early as mid-February and lasts through July (Yosef, 1996). Nationwide, loggerhead shrike populations have declined significantly over the last 20 years. Loggerhead shrikes are still fairly common in parts of the San Francisco Bay area, but urbanization has reduced available habitat, and local populations are likely declining (Cade and Woods, 1997; Humple, 2008). Loss and degradation of breeding habitat, as well as possible negative impacts of pesticides, are considered to be the major contributors to the population declines exhibited by this species (Cade and Woods, 1997; Humple, 2008). In the South Bay, loggerhead shrikes breed in a number of locations in the region where open grassland, ruderal, or agricultural habitat with scattered brush, chaparral, or trees that provide perches and nesting sites occurs (Bousman, 2007e). This species occurs slightly more widely (i.e., in smaller patches of open areas providing foraging habitat) during the nonbreeding season. Numbers have declined in the South Bay due to habitat loss, but ruderal habitats in the Master Plan area, particularly those on the closed landfill adjacent to the main plant, provide suitable breeding, roosting, and foraging habitat for up to one or two pairs.

**San Francisco Common Yellowthroat** (*Geothlypis trichas sinuosa*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The San Francisco common yellowthroat inhabits emergent vegetation and breeds in fresh and brackish marshes and moist floodplain vegetation around the San Francisco Bay. Common yellowthroats will use small and isolated patches of habitat as long as groundwater is close enough to the surface to encourage the establishment of dense stands of rushes, cattails, willows, and other emergent vegetation (Nur et al., 1997; Gardali and Evens, 2008). Ideal habitat, however, is comprised of extensive, thick riparian, marsh, or herbaceous floodplain vegetation in perpetually moist areas, where populations of brown-headed cowbirds are low (Menges, 1998). San Francisco common yellowthroats breed primarily in fresh and brackish marshes, although they nest in salt marsh habitats that support tall vegetation (Guzy and Ritchison, 1999). This subspecies builds open-cup nests low in the vegetation, and nests from mid-March through late July (Guzy and Ritchison, 1999; Gardali and Evens, 2008). The San Francisco common yellowthroat is one of the approximately 12 subspecies of common yellowthroat recognized in North America, two of which occur in the region. Because subspecies cannot be reliably distinguished in the field, determination of the presence of San Francisco common yellowthroat can be achieved only by locating breeding birds in the breeding range known for this subspecies. Common yellowthroats breeding along the edge of the Bay and in riparian and wetland habitats away from the Bay from the Milpitas/northern San José/Santa Clara/Los Gatos area northward are considered San Francisco common yellowthroats, while those breeding from southern San José southward are of the more widespread subspecies arizela. The demarcation between the two subspecies apparently occurs somewhere in the mid-San José area (Grinnell and Miller, 1944).
In the South Bay, the San Francisco common yellowthroat is a fairly common breeder in fresh and brackish marshes. It is known to breed near the edge of the South Bay, as well as in herbaceous riparian habitat and ruderal floodplain habitat along streams entering the Bay. Within the Master Plan vicinity, the species is a common, year-round resident in marsh vegetation along Moffett Channel, and the lower, tidal reaches of the Sunnyvale West Channel, which provide suitable breeding and foraging habitat. It occurs in lesser numbers along the Cargill Channel and in the scattered patches of marsh vegetation around Ponds 1 and 2.

**Alameda Song Sparrow** (*Melospiza melodia pusillula*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The Alameda song sparrow is one of three subspecies of song sparrow that breed only in salt marsh habitats in the San Francisco Bay area (Chan and Spautz, 2008). Prime habitat for Alameda song sparrows consists of large areas of tidally influenced salt marsh dominated by cordgrass and gumplant and intersected by tidal sloughs, offering dense vegetative cover and singing perches. Although the *pusillula* subspecies (the “species” of special concern) is occasionally found in brackish marshes dominated by bulrushes, it is apparently very sedentary and is not known to disperse upstream into freshwater habitats (Basham and Mewaldt, 1987). While the range of the Alameda song sparrow has remained relatively unchanged over time, populations have been reduced substantially and are continually threatened by the loss and fragmentation of salt marshes around the Bay (Nur et al., 1997; Chan and Spautz, 2008).

Song sparrows nest as early as March, but peak nesting activity probably occurs in May and June. Salt marsh-breeding Song Sparrows in the Bay area (including *pusillula*) are known to breed about two weeks earlier than the more widespread, inland/freshwater-breeding race *gouldii* (Johnston 1954; Johnston 1956). This early breeding by *pusillula* is apparently an adaptation to breeding in a tidal environment, as high tides in late spring and early summer may destroy large numbers of nests.

This subspecies’ primary habitat is fully tidal salt marsh. Song sparrows apparently breed along the lengths of tidal sloughs and the creeks that flow into them, and where suitable song sparrow breeding habitat is continuous along such creeks, the species appears to breed continuously from tidal salt marshes, where the breeding subspecies is *pusillula*, upstream to freshwater marsh and woody riparian habitats, where the breeding subspecies is *gouldii*. The line of demarcation (or perhaps more accurately, the zone of intergradation) along these sloughs between these two subspecies is unknown (Rottenborn, 2007a). The Alameda song sparrow is thus presumed to be present in the Master Plan area in brackish-marsh habitat, where it is relatively common along Moffett Channel, lower Sunnyvale West Channel, along the Cargill Channel, and in the scattered patches of marsh vegetation around Ponds 1 and 2.

**Salt Marsh Wandering Shrew** (*Sorex vagrans halicoetes*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The salt marsh wandering shrew occurs primarily in medium-high wet tidal marsh (6 to 8 feet above mean sea level) with abundant driftwood and other debris for cover (Shellhammer, 2000). This species has also been recorded in diked marsh habitat. Within these habitats, individuals typically prefer patches of tall pickleweed, in which they build nests. Salt marsh wandering shrews breed and give birth during the spring, however, very little is known about the natural history of this species.
The salt marsh wandering shrew was historically more widely distributed in the San Francisco Bay, but it is currently confined to salt marshes in the South Bay (Findley, 1955). Salt marsh wandering shrews are occasionally captured during salt marsh harvest mouse trapping studies, but the difficulty in identifying them to species has precluded a better understanding of their current distribution in the South Bay. The shrew was formerly recorded from marshes of San Pablo and San Francisco Bays in Alameda, Contra Costa, San Francisco, San Mateo, and Santa Clara counties, but captures in recent decades have been very infrequent in these areas.

Although this species’ distribution and habitat associations in the South Bay are not well known, this species is presumed to be potentially present in the Master Plan area in the same locations where the salt marsh harvest mouse may occur (i.e., tidal brackish marsh in Moffett Channel and possibly pickleweed-dominated areas around the Cargill Channel).

**Western Red Bat** (*Lasiurus blossevillii*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The western red bat is a locally common bat in coastal California and the Central Valley, and its range extends from Shasta County to Baja California, Mexico (Zeiner et al., 1990b). Western red bats are strongly associated with intact cottonwood and sycamore valley riparian habitats in low elevations (Pierson et al., 2006), and the loss of such habitats throughout the species’ range threatens the persistence of the western red bat. Both day and night roosts are usually located in the foliage of trees; red bats in the Central Valley show a preference for large trees and extensive, intact riparian habitat (Pierson et al., 2006). Day roosts are often located along the edges of riparian areas, near streams, grasslands, and even urban areas (Western Bat Working Group 2005). During the breeding season, red bats establish individual tree roosts and occasionally small maternity colonies in riparian habitats (Zeiner et al., 1990b). Little is known about the habitat use of western red bats during the nonbreeding season (Pierson et al., 2006). The red bat uses echolocation to capture insects in mid-flight, and requires habitat mosaics or edges that provide close access to foraging sites as well as cover for roosting (Zeiner et al., 1990b).

The Central Valley is assumed to be the primary breeding location of western red bat populations in California, and red bats likely occur in the San Francisco Bay Area only during winter and migration (Pierson et al., 2006). Therefore, Western red bats are expected to be occasional migrants and winter residents within the Master Plan area, but they are not known or expected to breed here. Individual male and female bats may occur as occasional migrants during the fall and spring or as foragers during the winter, and nonbreeding individual males may occur during the summer. No breeding females occur in the Master Plan area during the summer. Small numbers of western red bats may occasionally roost in the foliage in trees virtually anywhere throughout the Master Plan area.

**State Fully Protected Species**

**White-tailed Kite** (*Elanus leucurus*). Federal Listing Status: None; State Listing Status: Fully Protected. In California, white-tailed kites can be found in the Central Valley and along the coast, in grasslands, agricultural fields, cismontane woodlands, and other open habitats (Zeiner et al., 1990a; Dunk, 1995; Erichsen et al., 1996). White-tailed kites are year-round residents of the state, establishing breeding territories that encompass open areas with healthy prey populations, and snags, shrubs, trees, or other nesting substrates (Dunk, 1995). Nonbreeding birds typically remain...
in the same area over the winter, although some movements do occur. The presence of white-tailed kites is closely tied to the presence of prey species, particularly voles, and prey base may be the most important factor in determining habitat quality for white-tailed kites (Dunk and Cooper, 1994; Skonieczny and Dunk, 1997). Although the species recovered after population declines during the early 20th century, its populations may be exhibiting new declines as a result of recent increases in habitat loss and disturbance (Dunk, 1995; Erichsen et al., 1996).

In the vicinity of the Master Plan, white-tailed kites are known to nest along the northern edge of Santa Clara County throughout open areas along the San Francisco Bay (Bousman, 2007h). Although neither the Breeding Bird Atlas of Santa Clara County, California nor Santa Clara County Bird Data (unpublished) contained specific mention of the species as occurring in the Master Plan area, there are records of this species occurring in Moffett Field to the west and Sunnyvale Baylands Park to the east (CNDDDB, 2015).

White-tailed kites nest in trees or shrubs, typically in areas away from high human activity and with extensive open foraging habitat with adequate prey. In the Master Plan vicinity, there are foraging areas of adequate size to support white-tailed kites on the closed landfill adjacent to the main plant. The suitable trees for nesting and open ruderal habitat for foraging are present near the Master Plan area and these habitats may support up to one nesting pair.

**American Peregrine Falcon** (*Falco peregrinus anatum*). Federal Listing Status: None; State Listing Status: Fully Protected. The American peregrine falcon occurs throughout much of the world, and is known as one of the fastest flying birds of prey. Peregrine falcons prey almost entirely on birds, which they kill while in flight. These falcons nest on ledges and caves on steep cliffs, as well as on human-made structures such as buildings, bridges, and electrical transmission towers. In California, they are known to nest along the entire coastline, the northern Coast, and the Cascade Ranges and Sierra Nevada.

A severe decline in populations of the widespread North American subspecies *anatum* began in the late 1940s. This decline was attributed to the accumulation of DDE, a metabolite of the organochlorine pesticide DDT, in aquatic food chains. When concentrated in the bodies of predatory birds such as the peregrine falcon, this contaminant led to reproductive effects, such as the thinning of eggshells. The American peregrine falcon was listed as endangered by the USFWS in 1970 (USFWS, 1970) and by the State of California in 1971. Recovery efforts included the banning of DDT in North America, and captive breeding programs to help bolster populations. The USFWS removed the American peregrine falcon from the endangered Species List in 1999 (USFWS, 1999b), and the species was removed from the state endangered species list in 2009.

The closest locations within the Master Plan vicinity where peregrines have been detected nesting are in old raven and hawk nests on electrical transmission towers within managed ponds in the Mountain View area and on the wind tunnel at Moffett Field, approximately 1.5 miles northwest and 1.9 miles southwest of Pond 2, respectively. The species is not known to nest in the immediate Master Plan area, but peregrines nesting elsewhere in the South Bay, as well as migrants and wintering birds, forage regularly on waterfowl at Ponds 1 and 2.
**Water Purification Facilities**

To develop a list of special-status species that may occur in the WPF groundwater replenishment facilities area, EIR biologists collected and reviewed information in Rarefind (CNDDB, 2015) and the CNPS Rare and Endangered Inventory (2015) for Santa Clara County; and miscellaneous information available through the USFWS, the NMFS, the CDFW, and the Habitat Plan. Special-status plant species with a CRPR of 1, 2, 3, and 4 were also reviewed. From all of these sources, we created initial lists of special-status species considered for potential occurrence within the groundwater replenishment facilities area. The list was then refined by analyzing the suitable habitat types, edaphic conditions (e.g. serpentine and/or alkaline soils), and elevation range required by each species, as well as the locations of documented populations relative to the boundaries of the groundwater replenishment facilities area. Figure 4.7-6 and Figure 4.7-7 depict CNDDB-mapped locations of special-status plants and animals, respectively, in the vicinity of WPF areas.

**Special-status plants.** The CNPS (2015) and CNDDB (2015) identify 109 special-status plant species as potentially occurring in the WPF groundwater replenishment facilities area. This initial list was reduced to just one species, Congdon’s tarplant, by rejection of species that have been extirpated, for which suitable habitat or edaphic conditions are absent, or for which WPF facilities are outside the species’ elevation range. Although Congdon’s tarplant has the potential to occur in ruderal/non-native grasslands in the WPF area, particularly along the closed Sunnyvale Landfill in the northern portion of the groundwater replenishment facilities area, it is unlikely to be present elsewhere because extant populations in Santa Clara County exist only along the fringe of the San Francisco Bay. An expanded description of Congdon’s tarplant is provided above.

**Special-status animals.** The legal status and potential for occurrence of special-status wildlife species known to occur or potentially occurring in the general vicinity of the groundwater replenishment facilities area are given in Table 4.7-2. Expanded descriptions are also included below for those species that are known to occur in the WPF area or for which potentially suitable habitat occurs in the vicinity of the area; for which the site is accessible to animals from known populations; and for which resource agencies and/or the Habitat Plan have expressed particular concern such that more expanded discussion is required. Species that are listed in Table 4.7-2 but not discussed in detail below have no suitable habitat or reasonable expectation of occurrence in the WPF area.

Most of the special-status animal species that are present in less urbanized settings in the South Bay are absent from the WPF groundwater replenishment facilities due to a lack of suitable habitat and/or isolation of the groundwater replenishment facilities area from populations by urbanization, or because the WPF is outside the range of these species.10 Several special-status

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10 Such species include green sturgeon, longfin smelt, Central California Coast steelhead, Central Valley Fall-run Chinook salmon, California tiger salamander, California red-legged frog, foothill yellow-legged frog, San Francisco garter snake, coast horned lizard, bank swallow, bald eagle, golden eagle, Swainson’s hawk, short-eared owl, short-eared owl, California Ridgway’s rail, California black rail, western snowy plover, black skimmer, California brown pelican, yellow-breasted chat, grasshopper sparrow, Bryant’s savannah sparrow, San Francisco common yellowthroat, Alameda song sparrow, salt marsh harvest mouse, salt marsh wandering shrew, Townsend’s big-eared bat, ringtaill, American badger, and Pacific harbor seal.
CNDDB Records

Plants
- Specific Location
- Approximate Location
- General Area

Terrestrial Communities
- General Area

Sunnyvale WPCP

Conveyance Via Existing or New Pipelines

Siting Area for Injection Wells

Choris' lousewort
Dudley's slender poppy
San Rafael larkspur
San Francisco coastal fescue

Figure 4.7-6

CNDDB Plant Occurrences in the Vicinity of Water Purification Facilities

SOURCE: Esri, USGS, California Department of Fish and Wildlife's Biogeographic Data Branch (BDB).
LEGEND

- Siting Area for Injection Wells
- Recharge Basins
- CNDDB Records

Animals

- Specific Location
- Approximate Location
- General Area

Siting Area for Injection Wells
Conveyance Via Existing or New Pipelines
Recharge Basins

SOURCE: Esri, USGS, California Department of Fish and Wildlife's Biogeographic Data Branch (BDB).

Figure 4.7-7
CNDDB Wildlife Occurrences in the Vicinity of Water Purification Facilities
species, including American peregrine falcon, western red bat, pallid bat, redhead, common loon, and Vaux’s swift, may occur in the WPF groundwater replenishment facilities area only as nonbreeding visitors and are not expected to rely substantially on any resources within the groundwater replenishment facilities area.

Central California Coast steelhead and Central Valley Fall-run Chinook salmon are known to occur in Los Gatos Creek. However, an impediment to salmonid fish passage, the Camden Avenue drop structure, is located downstream of the groundwater replenishment facilities area. This drop structure is a 35-foot concrete slope that prevents fish from moving upstream during all flow conditions. Only portions of Los Gatos Creek below this barrier to fish passage are designated Essential Fish Habitat. The WPF includes construction of a new lateral pipeline to the McGlincey Ponds via Camden Avenue (upstream of the fish barrier) as part of the purified water delivery system. Therefore, steelhead and Chinook, and Essential Fish Habitat for Chinook salmon, are not present in the groundwater replenishment facilities area.

Some special-status wildlife species are addressed in greater detail below because they are known to breed or could potentially breed in the groundwater replenishment facilities area or its vicinity; because they occur fairly commonly as non-breeders in the groundwater replenishment facilities area (and thus could potentially be substantially affected by activities that occur with implementation of the WPF); and/or because they are of particular concern to regulatory agencies or the Habitat Plan. These include the western pond turtle, white-tailed kite, burrowing owl, yellow warbler, loggerhead shrike, tricolored blackbird, and San Francisco dusky-footed woodrat.

Federal or State Endangered and Threatened Species

Tricolored Blackbird (*Agelaius tricolor*). Federal Listing Status: None; State Listing Status: Endangered. A description of the tricolored blackbird’s status and ecology is provided above. Tricolored blackbird may forage and/or roost during the nonbreeding season in the groundwater replenishment facilities area. However, this species is not known to breed in the highly developed urban matrix of the Santa Clara Valley, and suitable nesting habitat is absent. Although the Habitat Plan identifies potential tricolored blackbird “primary habitat” within portions of the groundwater replenishment facilities area along Calabazas, San Tomas Aquino, Los Gatos, and Saratoga Creeks, these creeks do not provide suitable nesting habitat, and tricolored blackbirds only occur as occasional nonbreeding foragers.

California Species of Special Concern

Western Pond Turtle (*Actinemys marmorata*). Federal Listing Status: None; State Listing Status: Species of Special Concern. A description of the western pond turtle’s status and ecology is provided above. Although western pond turtle populations in the Santa Clara Valley have been greatly reduced by urbanization, including the release of non-native turtles, predation and harassment by pets and non-native mammals, capture by humans, degradation of water quality, loss of upland nesting habitat due to development, and the construction of barriers between creeks and nesting areas, a limited number of individuals may occur in streams in the WPF area. In the
vicinity of the WPF groundwater replenishment facilities area, the western pond turtle has been documented in Moffett Channel and Los Gatos Creek (CNDDB, 2015). Thus, this species could occur in the WPF groundwater replenishment facilities area where new or existing pipelines cross perennial streams, such as Los Gatos Creek. No western pond turtles occur in the proposed recharge basins in the Los Gatos Groundwater Recharge System proposed to be used as WPF facilities (HTH, 2012a).

**Burrowing Owl (**_Athene cunicularia_**). Federal Listing Status: None; State Listing Status: Species of Special Concern. A description of the burrowing owl’s status and ecology is provided above. Within the groundwater replenishment facilities area, the only location where burrowing owls may occur is at the closed Sunnyvale Landfill, as described above. No suitable habitat for the species, nor any recent occurrences, are located elsewhere in the WPF area.

**Loggerhead Shrike (**_Lanius ludovicianus_**). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). A description of the loggerhead shrike’s status and ecology is provided above. Within the WPF groundwater replenishment facilities area, the location where loggerhead shrikes are most likely to occur is at the closed Sunnyvale Landfill, as described above. Suitable habitat for the species is limited and of low quality elsewhere in the groundwater replenishment facilities area, and this species is not expected to occur (at least as a breeder) elsewhere.

**Yellow Warbler (**_Dendroica petechia_**). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The yellow warbler is a widespread neotropical migrant that inhabits wet deciduous forests throughout North America (Lowther et al., 1999). In California, yellow warblers occupy wooded riparian habitats along the coast, on both eastern and western slopes of the Sierra Nevada up to approximately 1,700 feet, and throughout the northern portion of the state (Heath, 2008). Their range has remained relatively stable over time, but populations have declined substantially in many localities due to habitat loss and expansion of the brood-parasitic brown-headed cowbird (Cain et al., 2003; Heath, 2008). As a result, breeding yellow warblers have been largely extirpated from the Santa Clara Valley (Heath, 2008). Ideal breeding habitat for yellow warblers consists of riparian corridors with dense, shrubby understory and open canopy (Lowther et al., 1999; Cain et al., 2003; Heath, 2008). Yellow warblers breed from early May through early August and construct open cup nests in upright forks of shrubs or trees in dense willow thickets or other dense vegetation (Lowther et al., 1999).

Yellow warblers are uncommon breeders in the vicinity of the WPF groundwater replenishment facilities area due to loss of riparian habitat, invasion by non-native plants, development along riparian corridors, and the abundance of the brown-headed cowbird in the region. However, small numbers of yellow warblers still breed in remnant riparian areas within Santa Clara County (Bousman, 2007f). Suitable breeding habitat consists of riparian corridors, often with an overstory of mature cottonwoods and sycamores, a midstory of box elder and willow, and a substantial shrub understory (Bousman, 2007f). Riparian areas with reduced understory due to grazing or disturbance are generally not used by this species, and riparian corridors lacking open ruderal or herbaceous vegetation along the edges of the corridors or with development up to the
corridor edge are often avoided as well. Thus, suitable breeding habitat is very limited in the WPF groundwater replenishment facilities area. However, this species is an abundant migrant in this area during the spring and fall, particularly where existing or new pipelines would cross riparian woodland habitats, and there is some potential for the species to nest in small numbers along Los Gatos Creek, and possibly Calabazas and Saratoga Creeks, within the WPF groundwater replenishment facilities area.

**San Francisco Dusky-footed Woodrat** (*Neotoma fuscipes annectens*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The San Francisco dusky-footed woodrat occurs in a variety of woodland and scrub habitats throughout the South Bay and the adjacent central coast range, south to the Pajaro River in Monterey County (Hall, 1981; Zeiner et al., 1990b). Woodrats prefer riparian and oak woodland forests with dense understory cover, or thick chaparral habitat (Lee and Tietje, 2005). Although woodrats are locally common in many areas, habitat conversion and increased urbanization, as well as increasing populations of introduced predators, such as domestic cats, pose substantial threats to this subspecies (HTH, 2010). Dusky-footed woodrats build large, complex nests of sticks and other woody debris, which may be maintained by a series of occupants for several years (Carraway and Verts, 1991). Woodrats are also very adept at making use of human-made structures, and can nest in electrical boxes, pipes, wooden pallets, and even portable storage containers. Woodrat nest densities increase with canopy density and with the presence of poison oak (Carraway and Verts, 1991). While the San Francisco dusky-footed woodrat is described as a generalist omnivore, individuals may specialize on local plants that are available for forage (Haynie et al., 2007). The breeding season for dusky-footed woodrats begins in February and sometimes continues through September, with females bearing a single brood of one to four young per year (Carraway and Verts, 1991).

Because dusky-footed woodrats are extremely sensitive to non-native predators, their distribution in the mostly urban WPF groundwater replenishment facilities area is limited. Currently, with the exception of records along the northern portion of Coyote Creek and along the edges of the Santa Clara Valley, San Francisco dusky-footed woodrats do not occur in the more urbanized portions of Santa Clara County (HTH, 2010). However, there is some potential for the species to nest in small numbers in riparian habitat along Los Gatos Creek, and possibly Calabazas, San Tomas Aquino, and Saratoga Creeks, within the groundwater replenishment facilities area.

**State Fully Protected Species**

**White-tailed Kite** (*Elanus leucurus*). Federal Listing Status: None; State Listing Status: Fully Protected. A description of the white-tailed kite’s status and ecology is provided above. In the vicinity of the WPF area, white-tailed kites are known to nest along the northern edge of Santa Clara County in open areas along the San Francisco Bay (Bousman, 2007h). There are a number of records of white-tailed kite occurrences from the northern portion of the area and one record approximately two miles west of the injection well siting area (CNDDB, 2015), although much of the WPF area is densely urbanized and does not support suitable habitat for this species. This species may occur in the WPF area only where suitable trees for nesting and open ruderal habitat for foraging are present, such as on the closed landfill areas adjacent to the main plant.
4.7.2 Regulatory Setting

This section describes laws and regulations related to biological resources. These laws and regulations include protections for particular species as well as those which protect certain types of habitats (such as marsh, wetlands, and open water) from disturbance or pollution. The following laws and regulations are included in this regulatory framework:

**Federal**
- Federal Endangered Species Act
- Magnuson-Stevens Fishery Conservation and Management Act
- Federal Migratory Bird Treaty Act
- Clean Water Act
- Rivers and Harbors Appropriation Act

**State**
- California Endangered Species Act
- California Environmental Quality Act
- California Native Plant Protection Act
- California Fish and Game Code
- Porter-Cologne Water Quality Control Act
- McAteer-Petris Act

**Regional**
- Santa Clara Valley Habitat Plan

**Local**
- Tree ordinances

### 4.7.2.1 Federal Regulations

**Federal Endangered Species Act**

The Federal Endangered Species Act (FESA) protects listed plant and wildlife species from harm or “take” which is broadly defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take can also include habitat modification or degradation that directly results in death or injury of a listed wildlife species. An activity can be defined as “take” even if it is unintentional or accidental. Listed plant species are provided less protection than listed wildlife species. Listed plant species are legally protected from take under the FESA only if they occur on federal lands or if the project requires a federal action, such as a Section 404 permit from the USACE. The USFWS has jurisdiction over federally listed threatened and endangered wildlife species under the FESA, while the NMFS has jurisdiction over federally listed, threatened and endangered, marine species and anadromous fish.

**Master Plan Area Applicability:** No federally listed plant species occur in the Master Plan area. Six wildlife species that are federally listed or proposed for listing potentially occur in the Master Plan area: green sturgeon, longfin smelt, Central California Coast steelhead, California Ridgway’s rail, western snowy plover, and salt marsh harvest mouse. If take of any of these species would occur as a result of Master Plan activities, the City would need to obtain take approval under FESA. That take approval would most likely occur through another federal agency, such as the USACE during CWA permitting.

**WPF Area Applicability:** No federally listed plant species or wildlife species occur in the WPF area. Central California Coast steelhead are known to occur in Los Gatos Creek. However, an impediment to salmonid fish passage, the Camden Avenue drop structure, is located downstream of the WPF area. This drop structure is a 35-foot concrete slope that prevents fish from moving upstream during all flow conditions. The WPF groundwater replenishment facilities includes
4. Environmental Setting, Impacts, and Mitigation Measures

4.7 Biological Resources

construction of new lateral pipeline to the McGlincey Ponds via Camden Avenue (upstream of the fish barrier) as part of the purified water delivery system. Therefore, steelhead are not present in the groundwater replenishment facilities area.

**Magnuson-Stevens Fishery Conservation and Management Act**

The Magnuson-Stevens Fishery Conservation and Management Act governs all fishery management activities that occur in federal waters within the United States’ 200-nautical-mile limit. The Act establishes eight Regional Fishery Management Councils responsible for the preparation of fishery management plans (FMPs) to achieve the optimum yield from U.S. fisheries in their regions. These councils, with assistance from the NMFS, establish Essential Fish Habitat in FMPs for all managed species. Federal agencies that fund, permit, or implement activities that may adversely affect Essential Fish Habitat are required to consult with the NMFS regarding potential adverse effects of their actions on Essential Fish Habitat, and respond in writing to recommendations by the NMFS.

**Master Plan Area Applicability:** The San Francisco Bay is officially listed as Essential Fish Habitat related to the Pacific Coast Salmon FMP, and in the South Bay, the Chinook salmon represents this FMP (Pacific Fisheries Management Council, 1999). Chinook are not known to spawn in any channels within the Master Plan area, and although occasional strays may occur in these channels, they are expected to occur in the Master Plan area irregularly and in low numbers at best.

A number of fish species regulated by the Coastal Pelagics and Pacific Groundfish FMPs, such as the leopard shark (*Triakis semifasciata*), English sole (*Parophrys vetulus*), starry flounder (*Platichthys stellatus*), and big skate (*Raja binoculata*), occur in the tidal habitats of South San Francisco Bay and are expected to occasionally disperse upstream into the reaches of tidal sloughs in the Master Plan area, such as Moffett Channel and possibly the lower reach of the Sunnyvale West Channel. Species such as the northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), and jack mackerel (*Trachurus symmetricus*) also occur in the South Bay. These species are less likely to occur in the uppermost tidal reaches of sloughs where proposed Master Plan improvements would occur, but small numbers could potentially occur there. Thus, the NMFS may consider tidal waters in the Sunnyvale West Channel to be Essential Fish Habitat related to all three of the aforementioned FMPs.

**WPF Area Applicability:** Central Valley Fall-run Chinook salmon are known to occur in Los Gatos Creek. However, an impediment to salmonid fish passage, the Camden Avenue drop structure, is located downstream of the WPF groundwater replenishment facilities area. This drop structure is a 35-foot concrete slope that prevents fish from moving upstream during all flow conditions. Only portions of Los Gatos Creek below this barrier to fish passage are designated Essential Fish Habitat. The groundwater replenishment facilities includes construction of new lateral pipeline to the McGlincey Ponds via Camden Avenue (upstream of the fish barrier) as part of the purified water delivery system. Therefore, no Essential Fish Habitat occurs within the groundwater replenishment facilities area.
Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (16 U.S.C., §703, Supp. I, 1989) prohibits killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. The trustee agency that addresses issues related to the Migratory Bird Treaty Act is the USFWS. Migratory birds protected under this law include all native birds. This act encompasses whole birds, parts of birds, and bird nests and eggs. The law protects active nests from destruction and all nests of species protected by the Migratory Bird Treaty Act, whether active or not, cannot be possessed. An active nest under this law, as described by the Department of the Interior in its 16 April 2003 Migratory Bird Permit Memorandum, is one having eggs or young. Nest starts, prior to egg laying, are not protected from destruction.

Master Plan Area Applicability: All native bird species occurring in the Master Plan area are protected by the Migratory Bird Treaty Act.

WPF Area Applicability: All native bird species occurring in the WPF area are protected by the Migratory Bird Treaty Act.

Clean Water Act

Overview

The CWA established the basic structure for regulating discharges of pollutants into “waters of the United States,” defined waters that have been or may be used for interstate or foreign commerce (such and the San Francisco Bay), interstate waters, territorial seas, and tributaries to these waters. Within California, Waters of the United States are also Waters of the State. The CWA statute provisions described here are implemented by the California State Water Resources Control Board in its regulations and associated permits. The act specifies a variety of tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff.

CWA Section 404

Under CWA Section 404, the USACE is responsible for regulating and issuing permits regarding the discharge of fill material into Waters of the U.S (including wetlands and other waters). The USACE defines wetlands in 33 CFR Part 323.2 as “areas defined as an area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions.” The boundaries of wetlands that fall under USACE jurisdiction are delineated using an approach that relies on identification of three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology indicators. In aquatic habitat, USACE jurisdiction extends to the ordinary high water mark which is defined in 33 CFR Part 328.3 as “the line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation or the presence of litter and debris.” In tidal waters, USACE jurisdiction extends to the landward extent of vegetation associated with salt or brackish water or the high tide.
line (see 33 CFR, Part 328.4). The high tide line is defined in 33 CFR Part 328.3 as “the line of intersection of the land with the water’s surface at the maximum height reached by a rising tide.”

CWA Section 401

No USACE permit would be effective in the absence of state Water Quality Certification pursuant to Section 401 of the CWA. The State Water Resources Control Board, together with the Regional Water Quality Control Boards (RWQCBs), regulate Water Quality Certification in California. Pursuant to Section 401 of the Federal CWA, projects that are regulated by the USACE must obtain a Water Quality Certification permit from the RWQCB. This certification ensures that the proposed project would uphold state water quality standards. Because California’s jurisdiction to regulate its water resources is much broader than that of the federal government (as described further in Section 4.7.2.2), proposed impacts on Waters of the State require Water Quality Certification even if the area occurs outside of USACE jurisdiction. Moreover, the RWQCB may impose mitigation requirements even if the USACE does not.

CWA Section 402

CWA Section 402 established the NPDES permit program to control sources that discharge pollutants into Waters of the U.S. These regulations are implemented at the regional level by RWQCBs and are designed to control pollutants in sensitive aquatic habitats. Bodies of water used for waste treatment processes that require an NPDES permit may be exempt from regulation as Waters of the U.S. under the following provision from 33 CFR Part 328.3(a)(8): “Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR Part 423.11(m) which also meet the criteria of this definition) are not Waters of the U.S.”

Master Plan Area Applicability: The Master Plan would affect 2.8 acres of potential Waters of the U.S. (Figure 4.7-1). Open water habitat subject to Section 404 of the CWA is limited to the Cargill Channel and Sunnyvale West Channel. Section 404 of the CWA also applies to northern coastal salt marsh and coastal brackish marsh associated with the Cargill Channel, Sunnyvale West Channel, and Moffett Channel. These impacts would require a Section 404 permit from the USACE, in addition to a Section 401 Water Quality Certification from the RWQCB. Open water and coastal brackish marsh associated with Ponds 1 and 2, their associated recirculation channels, and the detention pond in the main plant area are likely exempt from USACE jurisdiction under Section 404 following provision from 33 CFR Part 328.3(a)(8), which applies to features that are used for waste treatment processes.

WPF Area Applicability: Construction of the WPF groundwater replenishment facilities could affect potential Waters of the U.S., including wetlands and other waters, along one or more of the creeks that will be crossed by pipelines between the WPCP and injection well or recharge pond sites. Such impacts may occur if pipelines are constructed across creeks using trenching methods. The recharge basins to which WPF water may be conveyed are existing District facilities. Receipt of water from the WPF is not expected to change the existing status of the recharge basins vis a vis the jurisdiction of the USACE and RWQCB. Jurisdictional determinations will be made on a case-by-
case basis by the USACE. Impacts on Waters of the U.S. would require a Section 404 permit from the USACE, in addition to a Section 401 Water Quality Certification from the RWQCB.

**Rivers and Harbors Appropriation Act**

The aquatic or open waters component of bay habitat is also regulated by the USACE under Section 10 of the Rivers and Harbors Appropriation Act of 1899. Section 10 applies to “navigable Waters of the U.S.”, which is defined in 33 CFR, Part 329.4 to include all waters subject to the ebb and flow of the tide, and/or those which are presently or have historically been used to transport commerce. The shoreward jurisdictional limit of tidal waters are further defined in 33 CFR, Part 329.12 as “the line on the shore reached by the plane of the mean (average) high water.” It is important to understand that the USACE does not regulate wetlands under Section 10, only the aquatic or open waters component of bay habitat, and that there is overlap between Section 10 jurisdiction and Section 404 jurisdiction. According to 33 CFR, Part 329.9, a waterbody that was once navigable in its natural or improved state retains its character as “navigable in law” even though it is not presently used for commerce as a result of changed conditions and/or the presence of obstructions. Historical Section 10 Waters may occur behind levees, are currently not exposed to tidal or muted-tidal influence, and meet the following criteria: (1) the area is presently at or below the mean high water (MHW) line; (2) the area was historically at or below MHW in its “unobstructed, natural state”; and (3) there is no evidence that the area was ever above MHW.

If a project proposes to discharge dredged or fill material and/or introduce other potential obstructions in navigable Waters of the U.S., then both a Letter of Permission authorizing these impacts under Section 10 of the Rivers and Harbors Act and a CWA Section 404 permit must be obtained from the USACE.

**Master Plan Area Applicability:** The Master Plan area occurs on the fringe of the San Francisco Bay and within the historical baylands. As such, approximately 1.9 acres of navigable Waters of the U.S. along the Sunnyvale West Channel are present within its boundaries (Figure 4.7-1). The extent of Historical Section 10 Waters in the Master Plan area is depicted in Figure 4.7-2 and includes all primary historical sloughs, which are marked with a double blue-line. Historical sloughs bisect Ponds 1 and 2, the Cargill Channel, the Moffett Channel, and the Sunnyvale West Channel. Impacts on both current and historic Section 10 jurisdictional areas would require a Letter of Permission from the USACE.

**WPF Area Applicability:** Impacts on navigable Waters of the U.S. and Historical Section 10 Waters do not occur in the WPF groundwater replenishment facilities area owing to a lack of tidal waters and navigable rivers.

**4.7.2.2 State**

**California Endangered Species Act**

The CESA (Fish and Game Code of California, Chapter 1.5, Sections 2050-2116) prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or
endangered. In accordance with the CESA, the CDFW has jurisdiction over state-listed species. The CDFW regulates activities that may result in “take” of individuals listed under the Act (i.e., “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill”). Habitat degradation or modification is not expressly included in the definition of “take” under the Fish and Game Code. The CDFW, however, has interpreted “take” to include the “killing of a member of a species which is the proximate result of habitat modification.”

**Master Plan Area Applicability:** No state-listed plant species have the potential to occur in the Master Plan area. Five state-listed wildlife species occur, or potentially occur, in the Master Plan area: longfin smelt, California Ridgway’s rail, California black rail, tricolored blackbird, and salt marsh harvest mouse. If take of individual longfin smelt would occur during implementation of Master Plan improvements, then approvals from the CDFW would be required under CESA. No take of tricolored blackbird would occur during Master Plan implementation because this species occurs in the area only as a nonbreeding visitor and individual tricolored blackbirds would not be harmed. Because the California Ridgway’s rail, California black rail, and salt marsh harvest mouse are also designated as fully protected species by California Fish and Game Code, no take approvals would be granted for these species under CESA. Therefore, measures to avoid take of individual California Ridgway’s rails, California black rails, and salt marsh harvest mice would be necessary during implementation of Master Plan improvements.

**WPF Area Applicability:** No state-listed plant species have the potential to occur in the WPF groundwater replenishment facilities area. The tricolored blackbird may occur in the groundwater replenishment facilities area only as a nonbreeding visitor. Although the Habitat Plan identifies tricolored blackbird “primary habitat” within portions of the groundwater replenishment facilities area associated with Calabazas, San Tomas Aquino, Los Gatos, and Saratoga Creeks, this species is not expected to breed in this area due to a lack of suitable habitat and absence of breeding records from the vicinity.

**California Environmental Quality Act**

The CEQA and the CEQA Guidelines provide additional guidance in evaluating impacts of projects on biological resources which is considered herein. Under CEQA Guidelines Section 15065(a)(1), a project’s effects on biotic resources are deemed significant where the project would:

- “substantially reduce the habitat of a fish or wildlife species”
- “cause a fish or wildlife population to drop below self-sustaining levels”
- “threaten to eliminate a plant or animal community”
- “reduce the number or restrict the range of a rare or endangered plant or animal”

Compliance with CEQA Guidelines Section 15065(a) requires consideration of natural communities of special concern, in addition to plant and wildlife species. Vegetation types of “special concern” are tracked in Rarefind (CNDBB, 2015). The CDFW ranks sensitive vegetation alliances based on their global and state rankings analogous to those provided in the CNDBB. These are ranked G1-G5 using NatureServe’s standard heritage program methodology (NatureServe, 2014). If an alliance is marked as a G1-G3, all of the associations within it would
also be of high priority. The CDFW provides the Vegetation Classification and Mapping Program’s currently accepted list of vegetation alliances and associations (CDFW, 2010).

Section 15380(b) of the CEQA Guidelines provides that a species not listed on the federal or state lists of protected species may be considered rare if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definitions in the FESA and the CESA and the section of the Fish and Game Code dealing with rare or endangered plants or animals.

The CDFW has produced three lists (amphibians and reptiles, birds, and mammals) of “species of special concern” that serve as “watch lists”. Species on these lists are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Thus, their populations should be monitored. They may receive special attention during environmental review as potential rare species, but do not have specific statutory protection. All potentially rare or sensitive species, or habitats capable of supporting rare species, are considered for environmental review pursuant to the CEQA Section 15380(b).

**California Native Plant Protection Act**

The California Native Plant Protection Act (NPPA) was enacted in 1977 and allows the Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the NPPA. The NPPA prohibits take of endangered or rare native plants, but includes some exceptions for agricultural and nursery operations; emergencies; and after properly notifying CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

**Master Plan Area Applicability:** No plant species protected by the NPPA potentially occur in the Master Plan area.

**WPF Area Applicability:** No plant species protected by the NPPA potentially occur in the WPF area.

**California Fish and Game Code**

The California Fish and Game Code includes regulations governing the use of, or impacts on, many of the state’s fish, wildlife, and sensitive habitats. The CDFW exerts jurisdiction over the bed and banks of rivers, lakes, and streams according to provisions of Sections 1601–1603 of the Fish and Game Code. The Fish and Game Code requires a Lake and Streambed Alteration Agreement for the fill or removal of material within the bed and banks of a watercourse or waterbody and for the removal of riparian vegetation.

Ephemeral and intermittent streams, rivers, creeks, dry washes, sloughs, blue line streams on USGS maps, and watercourses with subsurface flows fall under CDFW jurisdiction. Canals, aqueducts, irrigation ditches, and other means of water conveyance may also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. Streams and riparian habitat are defined in Title 14, California Code of Regulations, Section 1.72, and Fish and Game Code Section 2786; respectively. Using these definitions, the lateral extent of a
stream and associated riparian habitat would fall under the jurisdiction of CDFW. These areas can be measured in several ways, depending on the particular situation and the type of fish or wildlife at risk. At minimum, CDFW would claim jurisdiction over a stream’s bed and bank. In areas that lack a vegetated riparian corridor, CDFW jurisdiction would be the same as USACE jurisdiction. Where riparian habitat is present, the outer edge of riparian vegetation is generally used as the line of demarcation between riparian and upland habitats.

Pursuant to Fish and Game Code Section 1603, CDFW regulates any project proposed by any person that will “substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds.” Fish and Game Code Section 1602 requires an entity to notify CDFW of any proposed activity that may modify a river, stream, or lake. If CDFW determines that proposed activities may substantially adversely affect fish and wildlife resources, an Lake and Streambed Alteration Agreement must be prepared. A Lake and Streambed Alteration Agreement sets reasonable conditions necessary to protect fish and wildlife, and must comply with the CEQA. The applicant may then proceed with the activity in accordance with the final permit.

Certain sections of the Fish and Game Code describe regulations pertaining to certain wildlife species. For example, Fish and Game Code Sections 3503, 2513, and 3800 (and other sections and subsections) protect native birds, including their nests and eggs, from all forms of take. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “take” by the CDFW. Raptors (e.g., eagles, falcons, hawks, and owls) and their nests are specifically protected in California under Fish and Game Code Section 3503.5. Section 3503.5 states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Non-game mammals are protected by Fish and Game Code Section 4150, and other sections of the Code (such as Sections 2050-2116, described above under California Endangered Species Act) protect other taxa.

**Master Plan Area Applicability:** In the Master Plan area, the Sunnyvale West Channel and associated open water, wetland, and upland habitats below the top of the levee that encloses it, potentially fall under CDFW jurisdiction. It is possible that marshes along Moffett Channel may be regulated by the CDFW as well. Impacts on areas determined to fall under the jurisdiction of the CDFW will require a Lake and Streambed Alteration Agreement. All the native birds, and most native fish, reptiles, amphibians, and mammals, in the Master Plan area are regulated to some extent by the California Fish and Game Code. In addition, five fully protected wildlife species potentially occur in the Master Plan area: California Ridgway’s rail, California black rail, white-tailed kite, peregrine falcon, and salt marsh harvest mouse.

**WPF Area Applicability:** Potential CDFW jurisdictional areas occur in the WPF area; these include wetlands and other waters along streams, and upland habitat types that are situated below the top of stream banks and/or levees. The CDFW may also consider vegetation that occurs outside of the stream channel, but is sustained by its hydrology, as riparian (e.g. vegetation that occurs below the top of stream banks) vegetation subject to CDFW regulation. Impacts on areas
determined to fall under the jurisdiction of the CDFW will require a Lake and Streambed Alteration Agreement. As noted above, most of the native vertebrates that occur in the WPF area are regulated by the California Fish and Game Code, and two fully protected wildlife species, white-tailed kite and peregrine falcon, potentially occur in the WPF area.

**Porter-Cologne Water Quality Control Act**

The State of California’s Porter-Cologne Water Quality Control Act provides the basis for water quality regulation within California and assigns primary responsibility for the protection and enhancement of water quality to the State Water Resources Control Board and the nine RWQCBs. The Act defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The Porter-Cologne Act allows the California SWRCB to adopt statewide Water Quality Control Plans or Basin Plans, which serve as the legal, technical, and programmatic basis of water quality regulation for a region. The Act also authorizes the NPDES program to protect Waters of the U.S. and the issuance of Waste Discharge Requirements to protect Waters of the State. Porter-Cologne broadly defines Waters of the State as “any surface water or groundwater, including saline waters, within the boundaries of the state.” Because Porter-Cologne applies to any water, whereas the CWA applies only to certain waters, California’s jurisdictional reach overlaps and may exceed the boundaries of Waters of the U.S. For example, Water Quality Order No. 2004-0004-DWQ states that “shallow” Waters of the State include headwaters, wetlands, and riparian areas. Moreover, the San Francisco Bay Region RWQCB’s Assistant Executive Director has stated that, in practice, the RWQCBs claim jurisdiction over riparian areas. Where riparian habitat is not present, such as may be the case at headwaters, jurisdiction is taken to the top of bank.

Under the Porter-Cologne, the State Water Resources Control Board and RWQCBs also have the responsibility of granting CWA NPDES permits and Waste Discharge Requirements (WDRs) for certain point-source and non-point discharges to waters. These regulations limit impacts on aquatic and riparian habitats from a variety of urban sources.

**Master Plan Area Applicability:** In the Master Plan area, Waters of the State encompass all Waters of the U.S. as described above. In addition, the San Francisco RWQCB may claim jurisdiction over upland habitat (e.g. ruderal/ non-native grassland) that is situated below the top of the levees in the Master Plan area. Impacts on Waters of the State require a Section 401 Water Quality Certification from the RWQCB. It is likely that the open water and coastal brackish marsh habitats associated with Ponds 1 and 2 would not be considered Waters of the State by the RWQCB as long as they continue to be used for wastewater treatment in accordance with an NPDES permit.

**WPF Area Applicability:** WPF activities could affect potential Waters of the State, including wetlands, other waters, riparian habitat, and upland habitat that occurs below the top of stream banks and/or levees. These impacts would require a Section 401 Water Quality Certification from the RWQCB. The recharge basins to which pipelines would carry purified water from the WPF are existing District facilities. Receipt of water from the WPF is not expected to change the existing status of the recharge basins with respect to RWQCB jurisdiction. Jurisdictional determinations will be made on a case-by-case basis by the RWQCB.
4. Environmental Setting, Impacts, and Mitigation Measures

4.7 Biological Resources

The McAteer-Petris Act

Section 4.2.2.2 (in Section 4.2, Land Use and Recreation) describes the McAteer-Petris Act in 1965 and the role of BCDC regarding the protection and use of the San Francisco Bay and Delta.

Master Plan Area Applicability: As noted in Section 4.7.1.4 and shown in Figure 4.7-3, approximately 24.5 acres of the Master Plan area are potentially subject to BCDC jurisdiction.

WPF Area Applicability: The WPF area does not overlap with BCDC jurisdiction.

4.7.2.3 Regional Regulations

Santa Clara Valley Habitat Plan

The Santa Clara Valley Habitat Agency leads the implementation of the Habitat Plan. It is a regional partnership between six local partners, including the County of Santa Clara, Santa Clara Valley Transportation Authority, the District, the Cities of San José, Gilroy, and Morgan Hill, CDFW, and USFWS. In 2013 the Habitat Plan was adopted by all local participating agencies, and permits were issued from the USFWS and CDFW. Both a habitat conservation plan and natural community conservation plan, or HCP/NCCP, the Habitat Plan is intended to help private and public entities plan and conduct projects and activities in ways that lessen impacts on natural resources, including specific threatened and endangered species within the area covered by the plan. The Habitat Plan identifies regional lands (called reserves) to be preserved or restored to benefit at-risk species, and describes how reserves will be managed and monitored to ensure that they benefit those species. In providing a long-term, coordinated planning for habitat restoration and conservation, the Habitat Plan aims to enhance the viability of threatened and endangered species throughout the Santa Clara Valley.

The Habitat Plan defines measures to avoid, minimize, and mitigate impacts on covered species and their habitats while allowing for the implementation of certain “covered projects”. The USFWS, a signatory of the Habitat Plan, would provide incidental take approval for the project’s impacts on federally listed species via Section 10 of the FESA, while the Habitat Plan also serves as the vehicle for the CDFW to authorize incidental take of state-listed species. However, Habitat Plan coverage of listed species only applies (a) to the species that are covered by the Habitat Plan, and (b) within the Habitat Plan boundary. Therefore, impacts in the Master Plan area, and in the portions of the WPF area outside the Habitat Plan boundary, are not covered by the Habitat Plan.

In conformance with the Habitat Plan, project proponents are required to pay impact fees in accordance with the types and acreage of habitat or “land cover” affected, and to implement conservation measures specified by the Habitat Plan. Land cover impacts are used because it is the best predictor of potential species habitat, and is applicable to all of the covered species (with the exception of the burrowing owl). The Santa Clara Valley Habitat Agency has mapped three fee zones in the Habitat Plan area: (A) ranchland and natural lands, (B), agricultural and valley floor lands, and (C) small vacant sites (SCVHA, 2015). The following areas are exempt from land cover fees:
4. Environmental Setting, Impacts, and Mitigation Measures
4.7 Biological Resources

- All development that occurs on land mapped by the Habitat Plan as urban-suburban, landfill, reservoir (excluding dams), or agriculture developed land cover types
- Other exempt activities include urban development in fee zones A-C on parcels less than 0.5 acre
- Additions to structures within 50 feet of existing structure that result in less than 5000 feet of impervious surface so long as there is no effect on wetland or serpentine land cover types
- Construction of recreational facilities within the reserve system.

Additional fees are imposed for projects that adversely affect serpentine habitat, wetlands, and burrowing owls, and for certain projects that result in atmospheric nitrogen emissions.

**Master Plan Area Applicability:** The Master Plan area occurs outside of the Habitat Plan area.

**WPF Area Applicability:** The WPF groundwater replenishment facilities area overlaps with the Habitat Plan area only within a small area in the City of San José and along Los Gatos Creek. Lands in this area are designated as Fee Zone B (Agricultural and Valley Floor Lands). If activities associated with the groundwater replenishment facilities affect non-developed land cover types within this area of the Habitat Plan, the District may need to pay fees and would be required to follow other Habitat Plan conditions (including implementation of a number of avoidance and minimization measures, particularly associated with streams and wetlands). In addition, wetland fees may be imposed on the portion of the groundwater replenishment facilities occurring within the Habitat Plan area.

**4.7.2.4 Local Regulations**

**Tree Ordinances**

The City of Sunnyvale Municipal Code requires that a Tree Removal Permit be obtained before any "protected tree" on private property within the city of Sunnyvale is removed. A protected tree is:

- Any single trunk tree 38 inches or greater in circumference (measured 4.5 feet above ground) and
- Any multi-trunk tree which has at least one trunk 38 inches or greater in circumference (12 inches diameter-at-breast height [DBH]) or where the measurements of the multi-trunks added together equal at least 113 inches.
- Removal of street trees, those in the parkway strip or public right-of-way, requires approval from the Trees and Landscape Division of the Department of Public Works.

The WPF pipeline may pass through the cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara. All of these cities have tree ordinances, though the details of the ordinances vary from city to city.

**Master Plan Area Applicability:** The Master Plan has the potential to adversely affect up to 41 trees subject to the City of Sunnyvale tree ordinance (shown in Table 4.7-3). Because this project is a City
project it is possible that no Tree Removal Permit or mitigation is necessary. However, if the City
determines that mitigation is required, the project would be required to replace the trees at a 1:1
ratio, typically within 90 days from the day the trees are removed, or would pay a fee-in-lieu of tree
replacement.

TABLE 4.7-3
ORDINANCE-SIZED TREES IN THE MASTER PLAN AREA

<table>
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<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Circumference (inches)</th>
<th>Multiple Stems (Yes / No)</th>
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<tr>
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</tbody>
</table>
WPF Area Applicability: The District would implement WPF activities such as construction of water pipelines and development of wells at injection sites. Pursuant to California Government Code Section 53091, the District may not be required to comply with local tree ordinances for projects like the WPF, but would provide mitigation for removing protected trees at a ratio that is equal to the requirements generally set forth by local ordinances regulating tree removals.

4.7.3 Impacts and Mitigation Measures

4.7.3.1 Thresholds of Significance

For the purposes of this EIR, an impact on biological resources is considered significant if implementation of the proposed project would result in any of the following:

- Substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS.
- Substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS.
- Substantial adverse effect on federally protected wetlands as defined by CWA Section 404 (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery areas.
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

4.7.3.2 Approach to Analysis

Master Plan Improvements. This section addresses biological resources issues associated with construction and operation of the proposed WPCP Master Plan improvements with regard to the significance criteria identified above.

For the reasons described below, there would be no impacts related to the following criteria:

Threshold of Significance: Would the project result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS?

No woody riparian habitat will be impacted by Master Plan activities. Natural communities of special concern and sensitive vegetation alliances occur in the Master Plan area, and are covered below under Impact BIO-3.
Threshold of Significance: Would the project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?

There are no adopted habitat conservation plans, natural community conservation plans, or other approved local, regional, or state habitat conservation plans that encompass the Master Plan area. Therefore, these significance criteria do not apply to the Master Plan.

Impact Assessment Assumptions. This impact analysis includes the following assumptions with respect to Master Plan impacts:

- The end use of Oxidation Pond 2 and the portion of Oxidation Pond 1 not used for the EQ/emergency storage basin could be:
  - Active tidal restoration – active breaching of outboard levees to allow tidal inundation and restoration of complex network of tidal channels and tidal marsh
  - Passive tidal restoration – if outboard levees are not maintained, they could breach, resulting in tidal channels and marsh, though lacking the complexity of intentionally restored marsh because breach locations and configuration of channels may not be optimal

- As shown in Table 3-2 in Chapter 3, Project Description, Master Plan implementation would result in an increase in discharge in treated effluent from the main plant.
  - An increase in effluent discharge into Pond 1, Sunnyvale West Channel, and Moffett Channel would lower the salinity levels of receiving waters. Net freshening of water could potentially drive a shift in plant community dynamics from saltwater marsh to freshwater plant species. However, previous studies on treatment plant discharge and its effects on salinity levels and vegetation dynamics in the South San Francisco Bay, have determined these effects to be minimal (in the context of larger-scale processes that affect plant communities in tidal marshes) and restricted to the immediate vicinity of the discharge point (HTH, 2011a). As a result, the magnitude and extent of habitat conversion from northern coastal salt marsh to brackish marsh, and increase in freshwater vegetation in brackish areas, would be very limited, likely only affecting the uppermost portion of the Moffett Channel.

- Construction staging areas and temporary parking areas, the precise location of which are currently unknown, would be located in previously developed areas and would not affect ruderal grassland or sensitive habitats.

Water Purification Facilities. This section addresses biological resources issues associated with construction and operation of the proposed WPF with regard to the significance criteria identified above. This impact analysis includes the following assumptions:

- Although water pipelines associated with WPF would be installed within currently developed areas (such as roadways) to the extent feasible, the precise locations of these facilities are currently unknown; the analysis therefore assumes that there is some potential for new pipelines to adversely affect sensitive habitats (e.g., by crossings creeks and riparian corridors).
• Water Purification facilities could result in an increase in salinity of effluent discharge if reverse osmosis (RO) concentrate is disposed via the existing shallow water outfall (Section 3.5.6).
  
  – Increasing the salinity of effluent discharge could potentially drive a shift in plant community dynamics from freshwater plant species to saltwater marsh species. However, due to dilution by tidal water from the bay, these effects would be minimal and restricted to the immediate vicinity of the discharge point. As a result, the magnitude and extent of any habitat conversion from brackish marsh to northern coastal salt marsh or freshwater vegetation to brackish vegetation would be very limited.

4.7.3.3 Impact Summary

Table 4.7-4 lists the project’s biological resources impacts and significance determinations.

4.7.3.4 Master Plan Impacts and Mitigation Measures

Impact BIO-1: The Master Plan could result in the loss of or damage to special-status plants, a less-than-significant impact with mitigation.

Only one special-status plant species, Congdon’s tarplant, has the potential to occur in the Master Plan area, where it could occur in the upper margins of wetland habitats and in ruderal/non-native grasslands. Although no individuals of this species were observed during the reconnaissance survey in August 2015, suitable habitat and alkaline soils that are known to support Congdon’s tarplant are present in Master Plan area. The current number of individuals of Congdon’s tarplant in the Master Plan area is expected to be low (if any) based on the absence of records from the vicinity and the absence of observations during the reconnaissance survey. However, a large population is known to occur at Sunnyvale Baylands Park, just one mile east of the main plant, and new individuals have the potential to appear in the Master Plan area over the course of Master Plan implementation.

Master Plan activities could potentially result in the mortality of individuals of Congdon’s tarplant through grading activities and subsequent discharge of fill material, operation of construction equipment, and improvements to the existing access road to Ponds 1 and 2. In addition, proposed activities could facilitate the introduction and/or spread of non-native invasive plant species, which could adversely affect Congdon’s tarplant individuals and habitat by out-competing the tarplant and reducing habitat suitability for this species. Several non-native, invasive species occur in the Master Plan area. Of these, broadleaved pepperweed, fennel, and ice plant are the most abundant, and are rated as having severe ecological impacts (Cal-IPC, 2015). Moderately invasive species can also have substantial and apparent ecological impacts. In the Master Plan area, these species include wild oats, Italian thistle, and alkali Russian thistle (Cal-IPC, 2015). Master Plan implementation could introduce new invasive species to the Master Plan area and/or result in the spread of existing populations of invasive species within and outside of the Master Plan area.
### TABLE 4.7-4
**SUMMARY OF IMPACTS – BIOLOGICAL RESOURCES**

<table>
<thead>
<tr>
<th>Impact Description</th>
<th>Master Plan</th>
<th>Water Purification Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO-1/WPF-BIO-1: Loss of or damage to special-status plants</td>
<td>LSM</td>
<td>LSM</td>
</tr>
<tr>
<td>BIO-2/WPF-BIO-2: Loss of or damage to special-status wildlife species</td>
<td>LSM</td>
<td>LSM</td>
</tr>
<tr>
<td>BIO-3/WPF-BIO-3: Loss of or damage to open water and wetland habitats</td>
<td>LSM</td>
<td>LSM</td>
</tr>
<tr>
<td>BIO-4/WPF-BIO-4: Loss of or damage to protected trees</td>
<td>LS</td>
<td>LSM</td>
</tr>
<tr>
<td>BIO-5/WPF-BIO-5: Interference with the movement of species</td>
<td>LSM</td>
<td>LSM</td>
</tr>
<tr>
<td>BIO-6: Impacts on nesting birds</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>WPF-BIO-7: Impacts on nesting birds and roosting bats</td>
<td>LSM</td>
<td>LSM</td>
</tr>
<tr>
<td>WPF-BIO-8: Loss of or damage to riparian habitat</td>
<td>LSM</td>
<td>LSM</td>
</tr>
<tr>
<td>WPF-BIO-9: Conflict with the an adopted habitat conservation plan</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**N/A** = Not Applicable.

**LS** = Less than Significant impact, no mitigation required.

**LSM** = Less than Significant with Mitigation required.
Owing to the regional rarity of Congdon’s tarplant, such impacts would be significant. Implementation of Mitigation Measures BIO-1a (Reduce Impacts on Congdon’s Tarplant) and BIO-1b (Prevent the Introduction and Spread of Non-native, Invasive Species) would reduce impacts of Master Plan activities on Congdon’s tarplant to a less-than-significant level.

Mitigation Measures

Mitigation Measure BIO-1a: Reduce Impacts on Congdon’s Tarplant

- Within 2 years prior to initial ground disturbance, the City will retain a qualified biologist, or require the contractor to retain a qualified biologist, to conduct protocol-level surveys for Congdon’s tarplant in the Master Plan area, including vegetated areas both within and outside the main plant fenceline. These surveys will be conducted in accordance with the protocols established by the CDFW and CNPS, and shall coincide with the bloom period for the species (May through November).

- If Congdon’s tarplant is present in the Master Plan area, the City contractor will avoid impacts on individuals of this species to the extent feasible during implementation of the Master Plan.

- If Congdon’s tarplant is present near the limits of disturbance, the City contractor will maintain a buffer free from construction-related activities around the tarplant occurrence; this buffer will be at least 50 feet if feasible, but large enough to avoid indirect impacts such as dust mobilization and alteration of hydrology. The City contractor shall demarcate the buffer in the field with orange fencing. No equipment, vehicles, or personnel shall be permitted within the buffer area during construction.

- If 15 percent or more of the known population of Congdon’s tarplant within five miles of the Master Plan area at the time of impact would be affected by the Master Plan, the City will provide compensatory mitigation. To compensate for loss of individual Congdon’s tarplants, offsite habitat either occupied by the species or suitable for restoration to support the species and revegetated with this species (such as Sunnyvale Baylands Park) shall be preserved and managed in perpetuity at a minimum 1:1 mitigation ratio (at least one plant preserved for each plant affected). Seeds from the affected population shall be collected and used to seed the mitigation area.

Mitigation Measure BIO-1b: Prevent the Introduction and Spread of Non-native, Invasive Species

- The City will retain a qualified biologist, or require the contractor to retain a qualified biologist, to develop an Invasive Species Management Plan to reduce the presence and spread of non-native, invasive plant species in the Master Plan area. The Invasive Species Management Plan shall be developed prior to any grading activities and prior to importing any fill material to the project areas, either within the main plant or outside of the main plant fenceline. The overarching goal of this mitigation is to halt the further expansion of existing invasive species and introduction of new invasives into sensitive habitats in project areas. The Invasive Species Management Plan shall include, but not be limited to, the following:
  - Prior to construction, the extent and locations of invasive species occurrences will be mapped within all areas proposed to be graded, including access roads...
and staging areas, and within all sensitive habitats (e.g., wetlands) across the project areas. This mapping will include project areas both within the main plant (especially along the fenceline) and outside the main plant fenceline, such as the access roads to Ponds 1 and 2.

- Areas identified to have weed infestations shall be treated prior to ground disturbance according to weed control methods detailed below:
  
  ▪ Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods approved for application. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the City of Newark, and implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 72 hours of a scheduled rain event. Where manual and/or mechanical methods are used, disposal of the plant debris will take place at an appropriate offsite location. The timing of the weed control treatment shall be determined for each plant species with the goal of controlling populations before they start producing seeds and/or encroach into adjacent areas from rhizomatous shoots. Consultation with a qualified wildlife biologist and plant ecologist shall be required prior to weed control treatments in sensitive habitats with the intent of avoiding any adverse impacts on special-status species in the area.

  ▪ Surveying and monitoring for weed infestations shall occur over the course of any grading operations along and outside the main plant fenceline. Treatment of all identified weed populations shall occur at a minimum of once annually.

  ▪ Once grading ceases, invasive plant populations within all sensitive habitats (such as wetlands) that are not impacted, but that are within 200 feet of grading/construction areas, shall be mapped and the aerial extent and location of invasive populations documented. Sensitive habitats within 200 feet of construction areas include portions of the Sunnyvale West Channel, the Cargill Channel, Ponds 1 and 2, and SCVWD Pond A4. This shall occur on an annual basis for a minimum of 3 years following grading operations.

  - If, in any monitoring year, the size of existing populations within sensitive habitats expands by 20 percent or more in terms of surface area in comparison to the population size documented prior to construction, the weed control measures described above shall be implemented (inter-annual variation due to climate differences may account for as much as 10 percent of change).

  - During construction activities, all seeds and straw materials used on site shall be weed-free rice straw, and all gravel and fill material shall be certified weed free.

  - During construction activities along and outside the main plant fenceline, vehicles and all equipment shall be washed (including wheels, undercarriages, and bumpers) before entering the project areas. Vehicles shall be cleaned at
existing construction yards or legally operating car washes. The project proponent shall document all vehicles have been washed prior to commencing work. In addition, tools such as chainsaws, hand clippers, pruners, etc., shall be washed before entering the work areas.

**Conclusion:** Less than Significant with Mitigation.

Impact BIO-2: The Master Plan could result in the loss of or damage to special-status wildlife species, a less-than-significant impact with mitigation.

A number of special-status wildlife species occur within and adjacent to the Master Plan area. Table 4.7-5 lists the general associations between habitat types and special-status wildlife species groups within the Master Plan area, and Table 4.7-6 summarizes habitat impacts associated with the proposed Master Plan activities.

**TABLE 4.7-5**

**SPECIES-HABITAT ASSOCIATIONS**

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Salt Marsh Mammals</th>
<th>Biotic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Salt Marsh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Associated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fish</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developed/Landscaped</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Ruderal/Non-native Grassland</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Northern Coast Salt Marsh</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Coastal Brackish Marsh</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Open Water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 4.7-6**

**MASTER PLAN HABITAT AFFECTED**

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Master Plan Impacts (in acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed/Landscaped</td>
<td>31.5</td>
</tr>
<tr>
<td>Ruderal/Non-native Grassland</td>
<td>3.2</td>
</tr>
<tr>
<td>Northern Coast Salt Marsh</td>
<td>0.5</td>
</tr>
<tr>
<td>Coastal Brackish Marsh</td>
<td>16.7</td>
</tr>
<tr>
<td>Open Water *</td>
<td>401.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>453.4</strong></td>
</tr>
</tbody>
</table>

* Implementation of a floodwall as part of the District’s Sunnyvale East and West Channels Flood Protection Project would reduce the acreage of this impact by 0.3 acre.
Based on current design concepts, Master Plan improvements could adversely affect special-status wildlife species and their habitats. These improvements could affect up to 31.5 acres of developed or landscaped land cover, 3.2 acres of non-native grassland and ruderal habitats, 16.7 acres of coastal brackish marsh, 0.5 acre of northern coast salt marsh, and 401.5 acres of open water habitats, including Ponds 1 and 2 and portions of the Moffett, Cargill, and Sunnyvale West Channels. Construction-related and operation-related impacts are presented here for each special-status species potentially affected by the Master Plan improvements.

**Construction-related Impacts**

**Special-status Fish and Essential Fish Habitat.** As described in Section 4.7.1.3, green sturgeon, longfin smelt, Central California coast steelhead, and Central Valley fall-run Chinook salmon have at least a minimal potential to occur within open water habitats in the Master Plan area, particularly in the lowermost reach of the Sunnyvale West Channel. Tidal waters in this area are also considered Essential Fish Habitat by the NMFS. Improvement of the levee road leading from the main plant to Pond 1 could result in the fill of 0.3 acre of open-water habitat in the lower portion of the Sunnyvale West Channel that is considered Essential Fish Habitat and that could at least occasionally support special-status fish. In addition, impacts on water quality during construction could potentially affect these species if construction materials, sediment, or pollutants enter the water. Other construction activities associated with proposed improvements that could potentially result in impacts on special-status fish include grading, excavation, sheet pile driving, pile driving for foundation construction, and groundwater dewatering. Noise and vibrations from excavation, sheet pile driving for dewatering, and pile driving for foundations could disrupt the behavior and movement of fish in adjacent waterways. Noise and vibrations from pile driving can even injure or kill fish if loud enough, or if pile driving occurs close enough to fish.

As described in Section 4.10, Water Quality (Impact WQ-4), construction activities associated with active restoration of Pond 2 and portions of Pond 1 could potentially result in water-quality impacts during breaching. However, restoration of Ponds 1 and 2 (either actively or passively) would benefit special-status fish species if they are restored to tidal action by substantially increasing the availability of foraging habitat within the Master Plan area; this benefit would be greater if Ponds 1 and 2 are actively restored rather than passively restored due to the anticipated greater extent and quality of tidal channels in actively restored marsh.

Impacts on Essential Fish Habitat and potential habitat of special-status fish along the lower Sunnyvale West Channel do not warrant compensatory mitigation because of the marginal quality of this habitat, as indicated by the lack of records of special-status species in the Master Plan area. However, impacts on individual special-status fish (e.g., from adverse water-quality effects, vibration, or noise) are potentially significant given the low population sizes of these species in the South Bay. Potential impacts on special-status fish would be reduced to a less-than-significant level

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11 Implementation of a floodwall as part of the District’s Sunnyvale East and West Channels Flood Protection Project would preclude this impact.
with implementation of **Mitigation Measures BIO-2a (Worker Environmental Awareness Training), BIO-2b (Minimization of Impacts on Water Quality), and BIO-2c (Special-Status Fish Measures).**

**Western Pond Turtle.** Master Plan activities associated with improvements to the road between the main plant and Pond 1 could impact up to 0.3 acre of open-water habitat in the Sunnyvale West Channel and a ditch on the west side of the road, south of the Cargill Channel, where western pond turtles may occur\(^\text{12}\). Construction-related activities within the main plant have a very low probability of affecting western pond turtles, but road widening and other construction-related activities along the lower Sunnyvale West Channel may result in the loss of individual turtles due to injury or mortality from heavy equipment or earth-moving. In addition, impacts on water quality during construction could potentially affect this species if construction materials, sediment, or pollutants enter water occupied by this species. Impacts on western pond turtles are potentially significant given the low populations of this species in the South Bay. Potential impacts on western pond turtles would be reduced to a less-than-significant level with implementation of Mitigation Measures BIO-2a (Worker Environmental Awareness Training), BIO-2b (Minimization of Impacts on Water Quality) to address potential water-quality impacts during construction, and **BIO-2d (Western Pond Turtle Measures).**

**Burrowing Owl.** As described in Section 4.7.1.3, the burrowing owl is known to occur, at least during the nonbreeding season, in the Master Plan vicinity on the closed landfill areas near the main plant, southwest of the former household hazardous waste drop-off site, and west of the Sunnyvale West Channel (Chromczak, 2014). Burrowing owls were formerly known to occur on berms around the eastern portion of the main plant area (Chromczak, 2014), but they have not been recorded on the main plant in recent years.

No impact on habitat used regularly by burrowing owls is expected to occur. Although owls may occasionally use burrows at the periphery of the Master Plan area, no recent occurrences of owls in these areas are known, and high levels of human disturbance and low habitat quality minimize the likelihood of owl occurrence in such areas. However, if construction activities were to occur in occupied burrowing owl habitat, individual burrowing owls may be killed or injured in burrows during earth-moving activities from destruction of burrows by equipment. There is a low probability of this impact due to the absence of proposed earth-moving activities in suitable burrowing owl habitat on the closed landfill and the lack of recent records of owls in the immediate vicinity of the main plant and floodwall construction areas. More likely, construction activities occurring in proximity to active burrows, such as during construction of the Bay Trail parking area or at the periphery of the existing main plant, may disturb owls in nearby areas. If owls were nesting nearby, abandonment of active nests, eggs, and young could occur. Because potentially suitable burrows for burrowing owls may be present in grassland or ruderal areas near the main plant or the Bay Trail parking area, there is some potential for owls to be disturbed by such Master Plan activities. The loss of an individual owl or an active nest, through direct

\(^{12}\) Implementation of a floodwall as part of the District’s Sunnyvale East and West Channels Flood Protection Project would preclude this impact.
4. Environmental Setting, Impacts, and Mitigation Measures

4.7 Biological Resources

Impact or (more likely) abandonment, would represent a significant impact under CEQA because of the species’ regional rarity and population declines. Therefore, Mitigation Measures BIO-2a (Worker Environmental Awareness Training) and BIO-2e (Burrowing Owl Measures) would be implemented to reduce potential impacts on burrowing owls to a less-than-significant level.

**California Ridgway’s Rail and California Black Rail.** California Ridgway’s rail has potential to occasionally forage in brackish marsh habitat in Moffett Channel, and it could nest along Guadalupe Slough adjacent to the Master Plan area. However, there is a low probability that it would forage as far upstream as the portion of Sunnyvale West Channel within the Master Plan area, or that it would nest in the Master Plan area. Similarly, the California black rail may occur in marsh habitats within the Master Plan area. Although black rails have not been recorded in Moffett Channel or Cargill Channel, and thus they are most likely to occur as a nonbreeding forager (in low numbers), nesting activity observed in the Alviso area to the northeast has increased in recent years, and there is some potential that the species may nest along lower Moffett Channel or Guadalupe Slough adjacent to the Master Plan area in the future.

Based on current design concepts, construction-related activities associated with levee and access road improvements would result in the loss of up to 1.5 acres of potential foraging habitat for these species in the tidal brackish marsh along Moffett Channel. Levee widening would destroy high-tide refugia associated with taller or denser vegetation on the east side of the levee road between the Cargill Channel and Moffett Channel, thus reducing cover for these species until such dense vegetation can become re-established following construction. Further, in the absence of mitigation measures, construction activities at Pond 1 could disturb nesting rails in marshes along lower Moffett Channel and Guadalupe Slough. If Pond 2 and portions of Pond 1 were restored to tidal action, then the Master Plan would result in a benefit to Ridgway’s rail and black rail by substantially increasing the availability of marsh habitats for foraging and nesting; this benefit would be greater if Ponds 1 and 2 were actively restored rather than passively restored. Nevertheless, there is some potential for disturbance of foraging or nesting individuals during breaching of Ponds 1 and 2 associated with tidal restoration. In addition, impacts on water quality during construction or levee breaching could potentially affect these species’ prey availability if construction materials, sediment, or pollutants enter the water and have adverse effects on their invertebrate prey. Due to the low population sizes of these species, impacts on individual California Ridgway’s rails and California black rails would be significant.

Impacts on potential foraging habitat of California Ridgway’s rail and California black rail along the Moffett Channel are not considered significant, and thus would not warrant mitigation, because of the marginal quality of this marsh for these species, as indicated by the lack of records of these species along the upper portion of Moffett Channel. All other potential impacts on California Ridgway’s rail and California black rail would be reduced to a less-than-significant level with implementation of Mitigation Measures BIO-2a (Worker Environmental Awareness Training), BIO-2b (Minimization of Impacts on Water Quality) to address potential water-quality impacts during construction, and BIO-2f (California Ridgway’s Rail and California Black Rail Measures). Because both of these species are listed as fully protected under the California Fish and Game Code, these measures are also necessary to avoid direct take of individuals.
San Francisco Common Yellowthroat and Alameda Song Sparrow. As described in Section 4.7.1.3, the San Francisco common yellowthroat and Alameda song sparrow nest in marsh habitats within the Master Plan area. Yellowthroat or song sparrow nests could be destroyed, and nesting birds could be disturbed, as a result of levee improvements, road improvements, and other activities associated with construction of the equalization basin, as small numbers of these species may nest in emergent vegetation within and around Ponds 1 and 2 in addition to the vegetation along the Cargill Channel, Moffett Channel, and Sunnyvale West Channel. Although there is a low probability of construction-related activities resulting in damage to nests within the main plant site, there is some potential for Master Plan improvements at the main plant and floodwall construction to disturb nesting pairs in immediately adjacent areas. Due to the number of nesting pairs that occur in or immediately adjacent to areas occupied by these species, a relatively large number of nests could potentially be damaged or disturbed, and given these subspecies’ limited distributions and population sizes, this impact would thus be considered potentially significant.

Based on current design concepts, approximately 17.1 acres of potential nesting, foraging, and refugial habitat of these species would be lost due to levee raising/widening between the main plant and the equalization basin, and to a lesser extent due to vegetation removal along the southern portion of Pond 1. In the long term, the Master Plan could result in a benefit to these species and a substantial increase in suitable habitat if Pond 2 and portions of Pond 1 are restored to tidal action; these benefits would be greater if Ponds 1 and 2 are actively restored rather than passively restored. In addition, if these two ponds were not breached, but rather were managed passively as wetlands, vegetation growth within Ponds 1 and 2 would likely increase habitat for these species substantially. Potential impacts on the San Francisco common yellowthroat and Alameda song sparrow would be reduced to less-than-significant levels with implementation of Mitigation Measures BIO-2a (Worker Environmental Awareness Training) and BIO-2h (Nesting Bird Measures).

Loggerhead Shrike and White-tailed Kite. Up to one pair each of loggerhead shrikes and white-tailed kites may nest in the vicinity of the Master Plan area, nesting in trees or shrubs and foraging in open habitats such as those on the closed landfill. Although Master Plan activities may adversely affect one nesting pair of each species through disturbance and increased human activity during construction, the temporary loss of one nesting territory during construction would not have a substantial effect on the regional populations of either species. Master Plan activities would not result in a loss of habitat for either species sufficient to result in the loss of any breeding pairs or foraging individuals in the Master Plan area. Therefore, potential construction-related impacts on loggerhead shrike and white-tailed kite would be less than significant. In addition, Mitigation Measure BIO-2h (Nesting Bird Measures) would avoid direct impacts on active nests of these species.

Tricolored Blackbird. Tricolored blackbirds occur in the Master Plan area only as nonbreeding individuals foraging and roosting on the site. Temporary disturbances to and direct loss of marsh habitats in the Master Plan area may disturb nonbreeding tricolored blackbirds foraging along the lower Sunnyvale West Channel or on the closed landfill, or roosting in marshes along the
lower Sunnyvale West Channel or Moffett Channel. The Master Plan would also result in the loss of some marsh roosting habitat. However, this species’ nonbreeding habitats are regionally abundant, the Master Plan would not impact habitat availability on the landfill, and the majority of marsh habitat in the vicinity would remain intact after implementation of Master Plan improvements. Temporary impacts on suitable habitat in and adjacent to the Master Plan area for these species would be limited, and direct loss of tricolored blackbirds would not occur. Therefore, Master Plan activities would have no effect on the regional abundance of tricolored blackbirds or on any nesting individuals, and such impacts would be less than significant.

**Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew.** The salt marsh harvest mouse and salt marsh wandering shrew may occur in the limited salt and brackish marsh habitats in the Master Plan area. Levee and road improvements could result in the loss of up to 2.0 acres of potential habitat for these species along the margins of both the Cargill Channel and Moffett Channel. Levee widening would destroy high-tide refugia associated with taller or denser vegetation on the east side of the levee road between the Cargill Channel and Moffett Channel, thus reducing cover for these species until such dense vegetation can become re-established following construction. In the absence of mitigation measures, individuals could be killed or injured from fill or movement of heavy equipment, or could be flushed from cover into areas where predation may occur. However, the salt marsh harvest mouse is fully protected, and measures to avoid direct take of individuals would be implemented. In the long term, if Pond 2 and portions of Pond 1 were restored to tidal action, the Master Plan would result in a benefit to salt marsh harvest mouse and salt marsh wandering shrew by substantially increasing the availability of suitable habitat; these potential benefits would be greater if Ponds 1 and 2 were actively restored rather than passively restored. In addition, if these two ponds were not breached, but rather were managed passively as wetlands, vegetation growth within Ponds 1 and 2 may increase habitat for these species if the vegetation was sufficiently saline to support salt or brackish marsh. Potential impacts on salt marsh harvest mouse and salt marsh wandering shrew would be reduced to a less-than-significant level with implementation of Mitigation Measures BIO-2a (Worker Environmental Awareness Training) and BIO-2g (Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew Measures).

**Operation-related Impacts**

Most operation-related impacts are not expected to adversely affect special-status wildlife species. Given the degree of noise and disturbance associated with the existing operation and maintenance activities within current main plant facilities, as well as current recreational use of the levees throughout the Master Plan area, the amount of human disturbance and noise from the WPCP is not expected to increase substantially over existing conditions following Master Plan implementation.

Following Master Plan implementation, the discharge of freshwater effluent from the WPCP would be somewhat greater than it is currently (refer to Table 3-2 in Chapter 3, Project Description). This has the potential to change the plant and animal communities using Moffett Channel and the lower Sunnyvale West Channel somewhat. However, such impacts would be extremely limited, and would likely be masked by variability in salinity and plant associations associated with
precipitation, fresh runoff from the Sacramento/San Joaquin River Delta (which influences salinity in the South Bay), and other factors. As a result, no substantial impacts on special-status animals are expected to result from increased freshwater effluent, either due to environmental conditions within the receiving waters (e.g., as perceived by fish) or due to changes in habitat.

Operational activities occurring within the diurnal equalization and emergency storage basins in a portion of the existing Pond 1 would be similar to wastewater treatment activities already being conducted at Pond 1, but the activities would be consolidated within a smaller footprint. Additionally, the retirement of the existing Pond 2 and a portion of Pond 1 would reduce WPCP operations and maintenance activities along miles of levee adjacent to these ponds and sensitive habitats such as the tidal marsh along lower Moffett Channel and Guadalupe Slough, thus reducing human disturbance in those areas. Thus, operational impacts on special-status species would be less than significant.

Mitigation Measures

Mitigation Measure BIO-2a: Worker Environmental Awareness Training

The City will retain, or require the contractor to retain, a qualified biologist to conduct mandatory contractor/worker environmental awareness training for all construction personnel working on project activities outside of the main plant, including but not limited to Ponds 1 and 2, the diurnal equalization and emergency storage basins, channel levees, and the Bay Trail parking relocation area. The awareness training will be provided to all construction personnel to brief them on the potential for special-status species to occur on the site, the need to avoid effects to special-status species and their habitats, and all project mitigation measures pertaining to biological resources and water quality. If new construction personnel are added, the contractor will ensure that the personnel receive the mandatory training before starting work. A representative will be appointed during the employee education program to be the contact for any employee or contractor who might inadvertently kill or injure a special-status species or who finds a dead, injured, or entrapped individual. The representative's name and telephone number will be provided to the City prior to the initiation of construction activities outside of the main plant.

Mitigation Measure BIO-2b: Minimization of Impacts on Water Quality

The following measures will be incorporated into the construction stormwater pollution prevention plan and implemented during construction of Master Plan improvements to avoid or minimize impacts on water quality:

- Earth-moving in areas draining to wetlands and aquatic habitats will not occur during days when rain is occurring or predicted to occur (i.e., greater than 30 percent chance) during the work period. This measure applies to all project areas with potential to drain to wetlands or aquatic habitats, particularly in or adjacent to the Southeast Channel, the Sunnyvale West Channel, the Cargill Channel, Ponds 1 and 2, and SCVWD Pond A4.

- All permit conditions, legal requirements, and appropriate dredging and engineering practices shall be followed to avoid and minimize water quality impacts associated with Master Plan activities. Suitable erosion control, sediment control, source control,

- Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). Feasible measures shall be implemented to ensure that hazardous materials are properly handled and the quality of aquatic resources is protected by all reasonable means when removing vegetation and sediments from the channels.

- No fueling shall be done in areas immediately adjacent to (i.e., within 50 feet of) channels, ponds, or wetlands. For stationary equipment that must be fueled on site, containment shall be provided in such a manner that any accidental spill of fuel shall not be able to enter the water or contaminate sediments that may come in contact with water. Any equipment that is readily moved out of the channels, ponds, or wetlands shall not be fueled in these sensitive habitat areas or the immediate floodplains surrounding them.

- A hazardous materials management/fuel spill containment plan will be developed and implemented by the construction contractor and given to all contractors and biological monitors working on the Master Plan, with at least one copy of the plan located onsite at all times. The purpose of the plan is to provide onsite construction managers, environmental compliance monitors, and regulatory agencies with a detailed description of hazardous materials management, spill prevention, and spill response/cleanup measures associated with the construction of Master Plan elements. The primary objective of the plan is to prevent a spill of hazardous materials. Elements of the plan will include, but are not limited to the following:
  - A discussion of hazardous materials management, including delineation of hazardous material and hazardous waste storage area, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas;
  - Materials Safety Data Sheets for all chemicals used and stored on site;
  - An inventory list of emergency equipment;
  - Spill control and countermeasures including employee spill prevention/response training;
  - Notification and documentation procedures; and
  - A monthly reporting plan.

- Vehicles will be checked daily for oil or fuel leaks and will be washed only at an approved area as described above for Mitigation Measure BIO-1b. No washing of vehicles will occur in Master Plan areas located outside of the main plant fenceline.

- The work site, areas adjacent to the site, and access areas will be maintained in an orderly condition, free and clear from debris and discarded materials. This measure includes all Master Plan areas located outside of the main plant fenceline. Personnel will not sweep, grade, or flush surplus materials, rubbish, debris, or dust onto adjacent areas or waterways. Upon completion of work, all building materials,
debris, unused materials, concrete forms, and other construction-related materials will be removed from the Master Plan areas located outside of the main plant fenceline.

- Stockpiled materials outside of the main plant fenceline will be covered by plastic sheeting, tarps, or similar material that can be secured during wind and rain. A sediment fence or berm will be installed around stockpiled dredged material to prevent runoff from transporting sediment into sensitive habitats (such as the channels, ponds, and wetlands). Heavy equipment will not be operated in the active channels or within wetland habitats, but instead from existing hardscape, access roads, and levees.

- Water conservation methods will ensure that water used in the Master Plan area does not create surface flows capable of carrying pollutants to the nearby creek channel. All personnel, including sub-contractors will be instructed on the practical methods of preventing leaks or over-use of watering, and will be required to adhere to the practices in the detail sheets provided. Woody debris from tree trimming, and other activities will not be left in the active channels or in wetland habitats.

- In-channel vegetation removal may result in increased local erosion in the channels due to increased flow velocity. To minimize such erosion, the toe of the bank will be protected by leaving vegetation within the channel to the maximum extent practicable.

- Cofferdams or silt fencing will be used to the extent feasible during construction and maintenance activities that could potentially result in substantial siltation of open water. For any work within aquatic or wetland habitats, such as Ponds 1 and 2 or the Cargill Channel, silt curtains will be installed to prevent suspended sediments from migrating out of the immediate work area, and dredging will be conducted on incoming tides to the extent feasible to further reduce the potential for sediment mobilization outside the Master Plan area. Dredging within aquatic or wetland habitats will be conducted with a closed clamshell-style dredge to reduce the amount of suspended sediment produced. Dredge volumes will be documented to ensure compliance with and adequate performance of these measures.

Mitigation Measure BIO-2c: Special-Status Fish Measures

The following measures will be implemented during construction of the Master Plan to avoid or minimize impacts on special-status fish species:

- Impacts on tidal waters where special-status fish and Essential Fish Habitat may occur will be minimized to the extent feasible.

- Construction activities in, or directly adjacent to, waters where green sturgeon, longfin smelt, steelhead, or Chinook salmon may be present will be performed between June 1 and November 30. These waters include but are not limited to the Moffett Channel and the Sunnyvale West Channel.

- Activities that extend into the waters where special-status fish may be present, such as levee breaching for active restoration of Ponds 1 and 2, will be performed at low tide and/or under de-watered conditions, to the extent practicable.
4. Environmental Setting, Impacts, and Mitigation Measures

4.7 Biological Resources

• If pile driving or installation of temporary sheet piles is necessary during construction or restoration activities outside of the main plant fenceline, such as for earthwork, foundations, or dewatering, then pile driving will be performed using a vibratory hammer to minimize the potential effects of noise and pressure-waves on fish.

• NMFS personnel will be immediately notified of any observed fish mortality events associated with Master Plan activities.

• Tidally restored ponds will contain channels that are adequate for the ingress and egress of fish with tidal circulation to avoid fish stranding.

• Treated wood will not be used in structures that may come into contact with water.

Mitigation Measure BIO-2d: Western Pond Turtle Measures

The following measures will be implemented to avoid and minimize impacts on western pond turtles in portions of the Master Plan area outside of the main plant fenceline, particularly in or near the Sunnyvale West Channel:

• Impacts on aquatic habitat of the western pond turtle, such as the Sunnyvale West Channel, will be minimized to the extent feasible.

• A qualified biologist shall conduct a survey for western pond turtles and their nests immediately (i.e., within 2 hours) prior to commencement of work along the Sunnyvale West Channel. If a western pond turtle is found in an area where it could be injured or killed by Master Plan improvement activities, the biologist will relocate the turtle to an appropriate site outside the construction disturbance area.

• Following the initial survey, a construction crewmember who has been trained to identify western pond turtles by a qualified biologist shall conduct a survey of the work area along the Sunnyvale West Channel area each morning prior to the onset of construction activities. If a turtle is located, all work in the vicinity shall immediately cease, and a qualified biologist shall be contacted. Work within the area shall not resume until the turtle has been relocated or has moved on its own out of the construction disturbance area.

• If an active western pond turtle nest is detected within the activity area, a 25 foot-buffer zone around the nest will be established and maintained during the nesting season (April 1 through August 31) until the young have left the nest or it is no longer active due to predation, as determined by a qualified biologist.

Mitigation Measure BIO-2e: Burrowing Owl Measures

The following measures will be implemented to avoid and minimize impacts on burrowing owls in the Master Plan area, particularly on the closed landfill and along the Sunnyvale West Channel but also including areas within the main plant fenceline that may support ground squirrel burrows:

• Preconstruction surveys for burrowing owls will be conducted by a qualified biologist prior to all construction activities that occur within 250 feet of potential burrowing owl habitat on the closed landfill or along the Sunnyvale West Channel,
in conformance with CDFW protocols. This measure applies to construction activities inside of the main plant fenceline only where ground squirrel burrows are present or for those activities located within 250 feet of suitable burrowing owl habitat on the closed landfill or Sunnyvale West Channel. The final survey will occur no more than 2 days prior to the start of any ground-disturbing activity such as clearing and grubbing, excavation, or grading, or any similar activity within 250 feet of suitable habitat that could disturb nesting owls. If no burrowing owls are located during these surveys, no additional action would be warranted. However, if burrowing owls are located on or immediately adjacent to impact areas, the following measures would be implemented.

- If burrowing owls are present during the nonbreeding season (generally 1 September to 31 January), the City/contractor would maintain a 150-foot buffer zone, within which no new Master Plan-related activity would occur, around the occupied burrow(s) if feasible. However, this buffer distance would not apply to existing operations and maintenance activities in the main plant. A reduced buffer distance is acceptable during the nonbreeding season as long as construction avoids direct impacts on the burrow(s) used by the owls. During the breeding season (generally 1 February to 31 August), a 250-foot buffer, within which no new Master Plan-related activity would be permissible, would be maintained between Master Plan activities and occupied burrows. Owls present at burrows on the site after 1 February would be assumed to be nesting on or adjacent to the site unless evidence indicates otherwise. This protected area would remain in effect until 31 August, or based upon monitoring evidence, until young owls are foraging independently or until the nest is no longer active.

- In the unlikely event that an occupied burrowing owl burrow is within the construction footprint (e.g., on the bank of a levee), and the burrow cannot be avoided, the owl will be evicted from the burrow by a qualified biologist using one-way doors. The biologist will leave the one-way doors in place for at least 48 hours, checking them daily to ensure that they are functioning properly. If the biologist cannot be certain that the owl is outside the burrow (e.g., if the one-way doors were installed when the owl was inside the burrow and the owl cannot be detected outside later), then the burrow will be excavated by hand prior to being filled to ensure that no owl is trapped inside. Otherwise, the burrow will be backfilled after the owl has been evicted. No burrowing owls will be evicted from burrows during the nesting season unless evidence indicates that nesting is not actively occurring (e.g., because the owls have not yet begun nesting early in the season, or because young have already fledged late in the season).

**Mitigation Measure BIO-2f: California Ridgway’s Rail and California Black Rail Measures**

The following measures will be implemented for activities outside of the main plant fenceline to avoid and minimize impacts on California Ridgway’s rails and California black rails, particularly in tidal marsh habitats associated with the Moffett Channel:

- Impacts on tidal wetland habitat of these species will be minimized to the extent feasible. Tidal wetland habitat for these species occurs in the northern portions of the Master Plan area, in association with the Moffett Channel. Suitable tidal wetland habitat for these species is not present within the main plant fenceline.
To avoid causing the abandonment of an active nest, construction activities within 700 feet of vegetated tidal marsh providing suitable breeding habitat for Ridgway’s rails or black rails (i.e., the area along Moffett Channel where the marsh begins to widen just upstream from its confluence with Guadalupe Slough, or the large marsh area along Guadalupe Slough north of Pond 1) will be avoided during the breeding season from February 1 through August 31 unless protocol-level surveys are conducted to determine rail locations and territories the same year in which those construction activities occur. If breeding Ridgway’s rails or black rails are determined to be present, activities will not occur within 700 feet of areas in which Ridgway’s rails or black rails were heard calling during protocol-level surveys. If the intervening distance across a major slough channel (e.g., Moffett Channel or Guadalupe Slough) or across a substantial barrier between the locations of rail detections and any construction activity area is greater than 200 feet, then it may proceed at that location within the breeding season. Aside from continued use of recreational trails established prior to the start of the breeding season (which may continue), only routine inspection, maintenance, or monitoring activities that have little potential for effects on rails due to their short durations, distance from rail habitat, or low-magnitude effects may be performed during the breeding season in areas within or adjacent to rail breeding habitat. Otherwise, with USFWS and CDFW approval on a case-by-case basis, construction activities may take place after July 15 in a given area if the activity is thought to be minimally disturbing to breeding rails.

- The extent of impacts on tidal marsh will be clearly demarcated in the field, and no impacts (including construction access) will occur outside those limits.
- Silt fencing or similar material will be installed between all areas of earth-moving and marsh outside the impact area to prevent dirt and other materials from entering marsh areas that are not intended to be affected.
- No animals can be brought to the project site to avoid harassing, killing, or injuring wildlife.
- The project site will be maintained trash-free, and food refuse will be contained in secure bins and removed daily during construction and dredging.
- Nighttime work near tidal marsh habitat will be avoided to the extent feasible. If nighttime work cannot be avoided, lighting will be directed to the work area and away from tidal marsh habitat.

**Mitigation Measure BIO-2g: Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew Measures**

The following measures will be implemented for activities outside of the main plant fenceline to avoid and minimize impacts on the salt marsh harvest mouse and salt marsh wandering shrew, particularly in marsh habitat associated with the Moffett Channel:

- Impacts on pickleweed and wetland habitat that may support these species will be minimized to the extent feasible. Wetland habitat that may support these species occurs in the northern portion of the Master Plan area, in association with the Moffett Channel and the Cargill Channel. No suitable habitat for these species occurs within the main plant fenceline.
• To avoid the loss of individual harvest mice or wandering shrews from any excavation, fill, or construction activities in suitable habitat, vegetation removal and fill in marsh habitats, including the Moffett Channel and the Cargill Channel, will be limited to the minimum amount necessary to implement the Master Plan improvements. Wherever feasible, sufficient pickleweed habitat will remain adjacent to the activity area to provide refugia for displaced individuals.

• In areas where salt marsh harvest mice or wandering shrew habitat will be affected, vegetation and debris that could provide cover for mice will be removed using only hand tools at least three weeks prior to the commencement of construction activities. Vegetation removal will occur under the supervision of a qualified biologist. The vegetation will be removed on a progressive basis, such that the advancing front of vegetation removal moves toward vegetation that would not be disturbed. In some cases, temporary shelter consisting of dead vegetation may be positioned to provide escape routes to suitable habitat. A qualified biologist will monitor the vegetation removal and make specific recommendations with respect to the rate of vegetation removal (to ensure that any harvest mice or wandering shrews present are able to escape to cover that will not be affected), whether vegetation needs to remain in a certain area temporarily to facilitate dispersal of mice into habitat outside the impact area, and whether any berms are necessary to allow mice or shrews to disperse across wetted channels.

• Following the hand-removal of vegetation in areas where these species may be affected, exclusion fencing will be erected as needed between construction areas and harvest mouse/wandering shrew habitat that is to remain unaffected to define and isolate protected habitat for these species. This fencing will consist of heavy plastic sheeting or metal material that cannot be climbed by harvest mice or wandering shrews, or similar Resource Agency-approved exclusion materials, buried at least 4 inches below the ground’s surface and with at least 1 foot (but no more than 4 feet) above the ground. All supports for the fencing will be placed on the inside of the work area. A 4-foot buffer will be maintained free of vegetation around the outside of the exclusion fencing. The fencing will be inspected daily during construction, and any necessary repairs will be made within 24 hours of when they are found. If any breaks in the fencing are found, a qualified biologist will inspect the work area for salt marsh harvest mice or wandering shrews. If any individual harvest mice are found within the impact footprint, they will be allowed to move on their own (although shrews may be relocated by a qualified biologist) to vegetated areas outside the impact footprint.

• During construction in areas where salt marsh harvest mice and wandering shrews may be affected, a qualified biologist will check underneath vehicles and equipment for these species before such equipment is moved during each day of construction, unless the equipment is surrounded by exclusion fencing.

• Based on current design concepts, the Master Plan is expected to affect approximately 1.5 acres of tidal coastal brackish marsh (in the Moffett Channel) and another 0.5 acre of non-tidal salt marsh (in the Cargill Channel) that could potentially support these species through raising (and as a result widening) an access road and construction of a new pipeline segment to the diurnal equalization basins. To compensate for these habitat impacts, the City will provide mitigation through a
combination of (a) the purchase of credits in an approved conservation bank that provides habitat suitable for use by these species and/or (b) tidal marsh habitat restoration onsite or offsite. Owing to the relatively low quality of habitat provided by the wetlands to be affected by Master Plan activities, this mitigation will be provided at a minimum ratio of 1:1 (mitigation:impact) on an acreage basis. This mitigation can be provided using the same mitigation area as described in Mitigation Measure BIO-3b for wetlands as long as the habitat is suitable for the salt marsh harvest mouse and salt marsh wandering shrew and provides vegetated wetlands adequate to compensate for impacts on these species’ habitats at a 1:1 ratio.

Prior to construction, the City will purchase credits from an approved conservation bank and/or prepare a Habitat Mitigation and Monitoring Plan (HMMP) describing the proposed creation of mitigation habitats that will satisfy the mitigation requirements. Impacts on habitat of the salt marsh harvest mouse and salt marsh wandering shrew may not commence until the adequate credits in a conservation bank have been purchased and/or the City prepares the HMMP. The HMMP will be prepared by a qualified restoration ecologist and will include the following:

− A summary of impacts on these species’ habitats and the proposed mitigation acreage
− Goals of the restoration to achieve no net loss of habitat functions and values for these species
− The location of the mitigation site and description of existing site conditions
− Mitigation design:
  ▪ Existing and proposed site hydrology, geomorphology, and geotechnical stability, if applicable
  ▪ Grading plan if appropriate, including bank stabilization or other site stabilization features
  ▪ Soil amendments and other site preparation elements as appropriate
  ▪ Planting plan
  ▪ Irrigation and maintenance plan
  ▪ Construction schedule
− Monitoring plan (including specific, objective final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.). Performance criteria will include demonstration of the presence of appropriate vegetation for these species within 10 years of mitigation implementation and presence of at least one of these two small mammal species within 10 years of the establishment of appropriate vegetated habitat.
− A contingency plan for mitigation elements that do not meet performance or final success criteria; this plan will include specific triggers for remediation if performance criteria are not being met.
Mitigation Measure BIO-2h: Nesting Bird Measures

The following measures will be implemented throughout the Master Plan area to minimize impacts on nesting San Francisco common yellowthroat, Alameda song sparrow, and other native bird species:

- Nesting deterrence can be implemented to minimize the potential for nesting birds to constrain project activities or to be adversely affected by those activities. The most effective nesting deterrence in non-developed portions of the main plant is vegetation removal to remove nesting substrate. Vegetation that is to be affected by the project should be removed during the nonbreeding season (i.e., September 1 through January 31) if feasible. If necessary, removal of nest-starts (incomplete nests that do not yet contain eggs or young) by qualified biologists may occur during the breeding season. Such nest-start removal may begin early in the breeding season (e.g., February) and continue regularly until vegetation can be removed and construction commences. Some species, such as barn swallows or black phoebes, may establish nests on buildings or other structures. To deter birds from nesting on structures, netting or other deterrence devices may be installed to preclude birds from constructing nests. Such nesting deterrence should be implemented under the supervision of qualified biologists in order to prevent death or injury of birds as a result of improperly installed deterrence devices, and such devices will require regular maintenance to ensure that they are functioning properly.

- Prior to commencement of new activities (i.e., activities that are not currently ongoing in any given area) during the breeding season (February 1 through August 31), preconstruction surveys will be conducted by a qualified biologist no more than 7 days prior to the initiation of new disturbance in any given area to ensure that no active nests of species protected by the Migratory Bird Treaty Act or California Fish and Game Code will be disturbed during Master Plan implementation. During this survey, the biologist will inspect all potential nesting habitats (e.g., trees, shrubs, buildings, and various substrates on the ground) in the project area for nests. This survey will include suitable nesting substrates both within and outside the main plant fenceline. Surveys will be conducted within search radii corresponding to disturbance-free buffer zones described below for raptors (300 feet) and non-raptors (100 feet), including offsite areas adjacent to the Master Plan area (where such areas are accessible).

- If an active nest is found, a qualified biologist will determine the extent of a disturbance-free buffer zone to be established around the nest until nesting has been completed. Disturbance-free buffer zones are typically 300 feet for raptors and 100 feet for non-raptors, although factors such as existing disturbance and vegetation or structures that screen construction activities from a nest will be considered in determining the appropriate buffer. Nests will be considered active until surveys conducted by a qualified ornithologist confirm nesting is complete. However, construction within these radii may proceed if, based on monitoring of the birds behavior, a qualified biologist determines that such activities are not likely to result in the abandonment of the nest. Pursuant to CDFW recommendations, monitoring will be conducted as follows:
  - A qualified biologist will monitor activity at each nest for three days prior to the onset of construction activities to develop a baseline of the normal behavior
4. Environmental Setting, Impacts, and Mitigation Measures

4.7 Biological Resources

A qualified biologist will monitor activity at each nest for 8 hours on the first day that construction occurs within the standard buffer (e.g., within 100 feet of a non-raptor nest). If the biologist determines that the birds’ behavior is not adversely affected, Master Plan activities may continue. The biologist should continue to monitor the nests for 1 hour/day on any day when construction activities occur within the standard buffer around an active nest.

If at any time the biologist determines that Master Plan activities within the standard buffer is adversely affecting the behavior of the birds such that the nest is in jeopardy of failing, construction activities should retreat to honor the standard buffer until the nest is no longer active (i.e., the young have fledged).

Conclusion: Less than Significant with Mitigation.

Impact BIO-3: The Master Plan could result in the loss of or damage to open water and wetland habitats that are considered Waters of the U.S. and/or State, a less-than-significant impact with mitigation.

Proposed Master Plan activities within the main plant site will not affect open water or wetland habitats that are considered Waters of the U.S./State. The north sludge lagoon in the northeast corner of the main plant site would be filled. However, this lagoon should be considered exempt from USACE/RWQCCB jurisdiction because it is used as part of the water treatment process under an existing NPDES permit. In addition, this sludge lagoon does not provide high-quality wildlife habitat, and thus impacts to it would not result in significant biological impacts, and no mitigation is needed for impacts to the north sludge lagoon.

Implementation of diurnal equalization and emergency storage would involve the removal of sludge from Ponds 1 and 2, improvement and raising/widening of the existing access road to the ponds, and raising and fortifying the existing berms along the access road to provide adequate protection from existing and future (with projected sea level rise) tidal flooding. Based on current design concepts, these activities have the potential to directly affect up to 33.4 acres of open water, coastal brackish marsh, and northern coastal salt marsh in the Master Plan area. These activities have the potential to directly affect up to 0.5 acre of northern coastal salt marsh in the Master Plan area, which is a natural community of special concern (CNDB, 2015) and host to pickleweed mats, a sensitive vegetation alliance (CDFW, 2010). In addition, these activities could directly affect up to 1.7 acre of coastal brackish marsh that is co-dominated by alkali bulrush, which is also a sensitive vegetation alliance (CDFW, 2010). Of the 33.4 acres, approximately 2.8 acres of these habitats are potential Waters of the U.S./State that are regulated under Section 404 of the CWA, occurring within and directly adjacent to the Cargill Channel, Moffett Channel and Sunnyvale West Channel. As discussed above under Section 4.7.2.1 above, Ponds 1 and 2, and the north sludge lagoon at the main plant are likely exempt from Section 404 under a provision from 33 CFR Part 328.3(a)(8) that addresses wastewater treatment facilities. Open water
and wetland habitats (including the ponds) in the Master Plan area may also be subject to federal (USACE) jurisdiction under Section 10 of the Rivers and Harbors Appropriation Act, and further, these areas may be claimed by the San Francisco RWQCB, CDFW, and BCDC. Jurisdictional areas and applicable regulations are discussed above under Section 4.7.1.4 and 4.7.2.1, respectively.

Impacts on water quality during construction may occur if construction materials, sediment, or pollutants enter the water. Construction activities associated with active restoration of Pond 2 and portions of Pond 1 could potentially result in water-quality impacts during levee breaching.

Pond 2 and a portion of Pond 1 would be decommissioned after 2035, once the proposed improvements to the WPCP were completed. The City of Sunnyvale would explore opportunities to implement habitat restoration within these areas, in partnership with regulatory agencies and possibly the South Bay Salt Ponds Restoration Project and USACE South San Francisco Bay Shoreline Study (Shoreline Study). Whether restoration occurs via planned breaches of the pond levees for tidal restoration or unplanned breaches (e.g., if the outboard levees are maintained), or whether Ponds 1 and 2 become unmanaged wetlands or RO concentrate treatment wetlands, the open water and wetland habitats within these ponds would be considered Waters of the U.S./State once they are no longer used for water treatment.

Indirect impacts on open water and wetland habitats in the Master Plan area and the vicinity may also occur as a result of the proposed improvements to the WPCP, including altered salinity levels from an increase in effluent discharged from the WPCP and tidal breaches; introduction of non-native invasive species and resultant degradation of wetland habitats; and increased erosion and sedimentation, including along new levee and along channel banks downstream of tidal breaches.

Water and salinity levels in the Sunnyvale West Channel and Moffett Channel are and would continue to be controlled by freshwater effluent that is discharged from the WPCP. In addition, these channels receive freshwater inputs from the upstream watershed and runoff, and saline input from tidal mixing with the waters of the San Francisco Bay. Under most conditions, effluent discharged from the WPCP would have a lower salinity than ambient waters in Pond 1 and the channels. An increase in effluent discharge into the channels would lower the salinity levels of the water, and could result in a net freshening of water in the vicinity. However, based on extensive monitoring effort of salinity and plant community dynamics in the South San Francisco Bay, vegetation type depends primarily on salinity as determined by major flushing events associated with freshwater influx from the Sacramento–San Joaquin Delta and other freshwater sources (HTH, 2011a). Further, the results of monitoring vegetation dynamics in the vicinity of the San José/Santa Clara Water Pollution Control Plant have indicated that effects from effluent discharge on salinity levels and wetland vegetation are restricted to a limited area in the near the discharge point (HTH, 2011a). Beyond this limited area, based on monitoring from 1989 to 2010, dynamic shifts in wetland vegetation that were observed in the recent past and over the longer term did not appear to be related to WPCP discharge. Altered salinity levels in Ponds 1 and 2 may also occur as a result of restoring the tidal connection between Ponds 1 and 2 and the San
Francisco Bay. This would increase saline inputs to the ponds, and plant communities may trend toward supporting greater cover of halophytic species.

Conversion of a portion of Pond 1 from its current condition to use for diurnal equalization and emergency storage would involve fill of portions of the pond and would change the habitat type and quality within that area. However, animals that currently use that area would continue to use the new basin to some extent, and the underlying use of that area (i.e., for water treatment) would not change. As a result, changes in use of that portion of Pond 1 would not constitute a significant impact. However, the loss of 2.8 acres of jurisdictional open water, coastal brackish marsh, and northern coastal salt marsh in the Cargill Channel, Moffett Channel, and Sunnyvale West Channel, as well as impacts on water quality within these features, would result in a significant impact due to the habitat functions and values provided by these areas. Implementation of \textit{Mitigation Measure WQ-4 (Water Quality Evaluation and Control Plan for Oxidation Pond Breaching and Restoration)} (refer to Section 4.10, Water Quality) and construction stormwater best management practices required under the NPDES Construction General Permit (described in Section 4.9, Hydrology) would reduce impacts on water quality and hydrology; implementation of Mitigation Measure BIO-2a (Worker Environmental Awareness Training) would help reduce impacts during construction; and implementation of Mitigation Measure BIO-2b (Minimization of Impacts on Water Quality) would reduce construction impacts on water quality. Implementation of those measures, as well as Mitigation Measures BIO-3a (Avoidance of Open Water and Wetland Habitats) and BIO-3b (Compensatory Mitigation for Aquatic and Wetland Habitats), would reduce impacts on jurisdictional wetlands and other waters to less-than-significant levels.

\textbf{Mitigation Measures}

\textbf{Mitigation Measure BIO-3a: Avoidance of Open Water and Wetland Habitats}

- Detailed design of WPCP improvements for the Master Plan will avoid and minimize impacts on open water and wetland resources to the extent feasible.

- If open water and wetland habitats are present within 100 feet or less of the limits of disturbance in the Master Plan area, avoidance buffers shall be maintained between construction areas and the aquatic resources. These buffers should be at least 50 feet for general construction activities and 100 feet for grading, to the extent feasible. The avoidance buffers shall be designated as Environmentally Sensitive Areas and clearly identified in the field using orange fencing. No equipment, vehicles, or personnel are permitted within Environmentally Sensitive Areas. Environmentally Sensitive Areas shall be shown on project plan sets. All Environmentally Sensitive Area fencing shall be maintained intact and in good condition throughout the duration of construction.

- Any temporarily affected aquatic and wetland habitats will be restored to preconstruction elevations and contours, and temporarily affected wetlands will be revegetated using native plant species appropriate for the salinity, elevation, and location of the affected area.
Mitigation Measure BIO-3b: Compensatory Mitigation for Aquatic and Wetland Habitats

The City shall obtain permits from the USACE, RWQCB, and CDFW as needed to obtain authorization to affect jurisdictional waters. In order to ensure that the proposed Master Plan results in no net loss of wetland and aquatic habitat functions and values, the City shall compensate for the permanent loss of jurisdictional wetland and aquatic habitats through a combination of on-site and/or offsite restoration/creation and protection and enhancement of wetland habitat. The size and location(s) of the area(s) to be restored/created will be determined based on appropriate mitigation ratios derived in consultation with USACE, RWQCB, and CDFW, but the amount of compensatory mitigation provided shall be at least 1:1 (i.e., at least equivalent to the acreage of jurisdictional wetlands and other waters permanently affected). Prior to construction, the City of Sunnyvale will purchase credits from a mitigation bank approved by the applicable resource agencies and/or prepare a Mitigation and Monitoring Plan describing the proposed creation of mitigation wetlands that will satisfy the mitigation requirements. Impacts on jurisdictional wetlands and other waters may not commence until the adequate credits in a mitigation bank have been purchased and/or the City of Sunnyvale prepares the Mitigation and Monitoring Plan.

The Mitigation and Monitoring Plan will be prepared by a qualified restoration ecologist and will include the following:

- A summary of wetland impacts and the proposed wetland creation mitigation
- Goals of the restoration to achieve no net loss of habitat functions and values
- The location of the mitigation site and description of existing site conditions
- Mitigation design:
  - Existing and proposed site hydrology, geomorphology, and geotechnical stability, if applicable
  - Grading plan if appropriate, including bank stabilization or other site stabilization features
  - Soil amendments and other site preparation elements as appropriate
  - Planting plan
  - Irrigation and maintenance plan
  - Construction schedule
- Monitoring plan (including specific, objective final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.). Performance criteria will include the establishment of wetland vegetation on any vegetated wetland mitigation area within 5 years of mitigation implementation.
- A contingency plan for mitigation elements that do not meet performance or final success criteria within 5 years; this plan will include specific triggers for remediation if performance criteria are not being met.

Conclusion: Less than Significant with Mitigation.
Impact BIO-4: The Master Plan could result in the loss of or damage to protected trees, a less-than-significant impact with mitigation.

Master Plan activities have the potential to adversely affect 41 trees subject to protection by the City’s tree ordinance. Table 4.7-3 indicates the size (circumference) and species/genera of each ordinance-sized tree in the Master Plan area. Only three protected alders (Alnus sp.) are species that are native to and occur naturally in the vicinity of the Master Plan area. The remaining 38 ordinance-sized trees are species that do not naturally occur in the immediate vicinity of the Master Plan area, including coast redwood, eucalyptus, lollypop tree, Peruvian pepper tree, and pine.

Trees in the Master Plan area are scattered and for the most part do not form a dense overstory, with the exception of a small (approximately 0.2-acre) patch of trees in the northwest corner of the main plant. Tree removal would not, therefore, increase incident sunlight reaching the water and vegetation below. Further, only two lollypop trees occur on the edge of coastal brackish marsh habitat, and thus, sensitive habitats would not be adversely affected by tree removal. As a result, and because only three of the trees to be removed are natives, the ecological impact of tree removal from Master Plan activities would be relatively limited. However, because removal of ordinance-sized trees would conflict with the City’s tree ordinance, this impact is potentially significant. The application of the ordinance must be determined on a case by case basis by the Department of Community Development. Because this project is a City project it is possible that no Tree Removal Permit or mitigation is necessary; however, if the Department of Community Development determines that mitigation is required, the City would implement Mitigation Measures BIO-4a (Avoidance and Preservation of Trees) and BIO-4b (Master Plan Compensation for Impacts on Protected Trees), which would reduce this impact to a less-than-significant level.

Mitigation Measures

Mitigation Measure BIO-4a: Avoidance and Preservation of Trees

During detailed design of Master Plan activities, either within or outside the main plant fenceline, ordinance-sized trees will be avoided to the extent feasible. If it is determined during detailed design that impacts on some trees can be avoided, a construction-phase Tree Preservation Plan shall be prepared by a certified arborist prior to initiation of construction to describe how trees that will not be removed will be protected. The construction-phase Tree Preservation Plan shall include the following tree protection measures, which are based on guidelines established by the International Society for Arboriculture:

- Establish an area surrounding individual trees or groups of trees to be protected during construction as defined by a circle concentric with each tree with a radius 1-1/2 times the diameter of the tree canopy drip line. This Tree Protection Zone is established to protect the tree trunk, canopy and root system from damage during construction activities and to ensure the long-term survival of the protected trees. The Tree Protection Zone shall: (1) ensure that no structures or buildings, that might restrict sunlight relative to the existing condition, will be constructed in proximity to the trees; and (2) that no improvements are constructed on the ground around the
tree within the Tree Protection Zone, thus ensuring that there is sufficient undisturbed native soil surrounding the tree to provide adequate moisture, soil nutrients and oxygen for healthy root growth.

- Protect tree root systems from damage caused by (a) runoff or spillage of noxious materials while mixing, placing, or storing construction materials and (b) ponding, eroding, or excessive wetting caused by dewatering operations through use of the following measures during excavation and grading:
  - Excavation: Do not trench inside tree protection zones. Hand excavate under or around tree roots to a depth of 3 feet. Do not cut main lateral tree roots or taproots. Protect exposed roots from drying out before placing permanent backfill.
  - Grading: Maintain existing grades within tree protection zones. Where existing grade is 2 inches or less below elevation of finish grade, backfill with topsoil or native site soil. Place fill soil in a single uncompacted layer and hand grade to required finish elevation.
  - Apply 6-inch average thickness of wood bark mulch inside tree protection zones. Keep mulch 6 inches from tree trunks.

- Provide 48-inch tall orange plastic construction fencing fastened to steel T-posts, minimum six (6) feet in length, using heavyweight plastic ratchet ties. Install fence along edges of tree protection zones before materials or equipment are brought on site and construction operations begin. Maintain fence in place until construction operations are complete and equipment has been removed from site.

- Provide temporary irrigation to all trees in protection zones using a temporary on-grade drip or bubbler irrigation system sufficient to wet the soil within tree protection zones to a depth of 30 inches per bi-weekly irrigation event.

**Mitigation Measure BIO-4b: Master Plan Compensation for Impacts on Protected Trees**

At the discretion of the Director of Community Development, the City will either replace any removed protected trees at a 1:1 ratio or pay an in-lieu fee into a fund.

**Conclusion:** Less than Significant with Mitigation.

**Impact BIO-5: The Master Plan could result in interference with the movement of native birds, a less-than-significant impact.**

The Master Plan area, particularly Ponds 1 and 2, the Cargill Channel, and the marshes along the Moffett Channel, supports high diversity and abundance of native, resident and migratory birds. The Master Plan area is located on the Pacific Flyway, and wetlands and managed ponds in the South Bay provide habitat for more than one million waterbirds each year, including large percentages of the populations of some shorebird, duck, and tern species (Accurso, 1992; Harrington and Perry, 1995; Page et al., 1999; Stenzel and Page, 1988; Takekawa et al., 2001).
Filling of marsh habitat along the lower Sunnyvale West Channel and Moffett Channel, filling of a portion of the Cargill Channel, and conversion of the southern part of Pond 1 from its current open-pond habitat to emergency storage uses would reduce overall bird use of the area by reducing the availability and/or quality of habitat. Marsh-associated birds such as nonbreeding Virginia rails and sora; nesting marsh wrens, San Francisco common yellowthroats, and Alameda song sparrows; and waterbirds such as ducks, American coots, egrets, and terns that use the open-water habitats of Cargill Channel and Pond 1 will likely have reduced abundance as a result of these impacts. Master Plan improvements to Pond 1 associated with the diurnal equalization and emergency storage basins would temporarily disturb waterfowl and phalaropes in the ponds and permanently alter the availability of habitat in that portion of Pond 1. The dirt-lined emergency storage basin may still provide suitable habitat for waterfowl when filled with water, but water discharges into the basin would be less frequent when it is used only for emergency storage.

Changes in the remaining portions of Pond 1 and in Pond 2 after the oxidation ponds are decommissioned are likely to have even greater effects on migratory bird use of the Master Plan area. Because the final disposition of the oxidation ponds is not yet known, the precise effects on various waterbird species are unknown, although general patterns under different end-use scenarios can be predicted. If Ponds 1 and 2 are breached, either intentionally or unintentionally, and converted to tidal waters, then phalaropes and American white pelicans will likely no longer use these ponds, as they are primarily associated with non-tidal habitats. In the short term, many of the dabbling ducks, diving ducks, herons, egrets, terns, and shorebirds that currently use the oxidation ponds can continue to use the open-water habitats and intertidal mudflats that would form in the former oxidation ponds. Over time, as the developing marshes within the tidal habitats in the former oxidation ponds become vegetated, these waterbirds will likely decline in abundance. However, marsh-associated birds, which may include common species such as Virginia rails, sora, and marsh wrens as well as a number of special-status marsh-associated birds, would increase in abundance as extensive tidal marsh habitat for these species develops in the former ponds. Because intentional breaching of levees and restoration of tidal action to Ponds 1 and 2 would involve more proactively planned restoration (e.g., regarding locations of breaches and other restoration details), the marshes that would develop with intentional restoration are expected to have more complex channel networks and higher-quality habitat for marsh species than those that would develop if unintentional levee breaching occurred.

If Ponds 1 and 2 are not breached, but instead remain ponds, it is likely that vegetation would increase within the oxidation ponds due to the lack of vegetation management. This change would benefit marsh-associated species while resulting in a reduction in open-water foraging habitat and barren roosting habitat (on the existing levees) used by many of the waterbirds that currently use habitat on the site. However, it is expected that all of the species of waterbirds that currently use Ponds 1 and 2 would continue to be present in these ponds if they are not converted to tidal action (though abundance of those species may change somewhat due to changing habitat conditions).
Because of the number of migratory birds that use the Master Plan area during migration and winter, modification of habitats resulting from Master Plan activities would result in changes in how some birds use these South Bay habitats during migration. However, Ponds 1 and 2, and other habitats that would be affected by Master Plan activities, provide only a fraction of the suitable habitat for various migratory bird species in the South Bay. For example, the South Bay Salt Ponds Restoration Project and Shoreline Study collectively involve tidal restoration and pond management for numerous species, including migratory birds, in more than 15,000 acres of habitat throughout the South Bay. These two projects include intensive monitoring and adaptive management over their 50-year lifespan to help ensure that extensive, high-quality tidal restoration can occur without resulting in substantial impacts on South Bay, Bay-Area, and Pacific Flyway-scale populations of migratory birds. As a result, (a) impacts on migratory bird populations, and migratory use of the South Bay, from Master Plan activities would be very small relative to changes that occur as a result of, and that are monitored by, the South Bay Salt Ponds Restoration Project and Shoreline Study; (b) if some migratory waterbirds are displaced by Master Plan activities, alternative habitat for most such birds would be available elsewhere in the South Bay (e.g., in areas managed by the South Bay Salt Ponds Restoration Project and Shoreline Study); and (c) conversion of Ponds 1 and 2 to tidal habitats or unmanaged wetland/pond habitat would maintain or improve habitat for many of the migratory bird species that currently use the Master Plan area. As a result, Master Plan activities are not expected to result in substantial declines in overall waterbird abundance or diversity in the South Bay, and overall Master Plan-specific impacts on migratory birds from Master Plan activities would be less than significant.

Mitigation: None required.

Impact BIO-6: The Master Plan could result in impacts on nesting birds, a less-than-significant impact with mitigation.

Large numbers of native birds nest within the Master Plan area. These include some special-status species, as discussed in previous impacts, but they also include common bird species. For example, birds such as Brewer’s blackbird, mourning dove, California towhee, and Anna’s hummingbird nest in landscaped habitats; barn swallow, cliff swallow, black phoebe, and house finch nest in and on structures in developed areas; red-winged blackbird and marsh wren nest in marsh habitats; and a variety of waterfowl nest in marsh and ruderal habitats near the aquatic habitats of the Master Plan area. Nesting habitat for these species would be reduced as a result of construction, nests of these species could be destroyed, and nesting birds could be disturbed as a result of virtually any of the construction activities, both within and outside the main plant, associated with Master Plan activities. Even if nests are not physically disturbed, construction near active nests could cause the abandonment of those nests by adults, potentially resulting in the loss of eggs or young.

Most of these species are regionally common, and therefore the proportion of regional populations of these species that could be adversely affected by Master Plan activities is relatively low. However, owing to the high bird diversity associated with habitats in and adjacent to the
Master Plan area, construction activities have the potential to result in the loss of large numbers of active bird nests, in the absence of mitigation measures. As a result, impacts on nesting birds are potentially significant. Implementation of Mitigation Measure BIO-2h (Nesting Bird Measures) would reduce impacts on nesting birds to less-than-significant levels.

**Mitigation Measures**

Implement Mitigation Measure BIO-2h (Nesting Bird Measures).

**Conclusion:** Less than Significant with Mitigation.

### 4.7.3.5 WPF Impacts and Mitigation Measures

**Impact WPF-BIO-1:** The WPF could result in the loss of or damage to special-status plants, a less-than-significant impact with mitigation.

With respect to WPF improvements implemented at the WPCP, the impacts to special-status plants would be identical to those described for the Master Plan in Impact BIO-1, above, and would be similarly mitigated.

Only one special-status plant species, Congdon’s tarplant, has the potential occur in the WPF area. It could occur in the upper margins of wetland habitats and in ruderal/non-native grasslands. The location within the WPF area where this species is most likely to occur is in the vicinity of the main plant and closed landfill, which could potentially be adversely affected by pipeline construction. A large population of this species is known to occur at Sunnyvale Baylands Park, just one mile east of the WPCP, and this species has been documented growing in disturbed environments with non-native plant species. The likelihood of this species’ occurrence elsewhere in the WPF area is very low.

If Congdon’s tarplant is present in the WPF area, it could be affected as described for Impact BIO-1. Implementation of Mitigation Measures WPF-BIO-1a (Reduce Impacts on Congdon’s Tarplant) and WPF-BIO-1b (Prevent the Introduction and Spread of Non-native, Invasive Species), focusing on WPF areas north of Caribbean Drive, would reduce impacts on Congdon’s tarplant from WPF activities to less-than-significant levels.

**Mitigation Measures**

**Mitigation Measure WPF-BIO-1a: Reduce Impacts on Congdon’s Tarplant**

- Within 2 years prior to initial ground disturbance, the District will retain a qualified biologist, or require the contractor to retain a qualified biologist, to conduct protocol-level surveys for Congdon’s tarplant in the WPF area. These surveys will be conducted in accordance with the protocols established by the CDFW and CNPS, and shall coincide with the bloom period for the species (May through November).
• If Congdon’s tarplant is present in the WPF area, the District contractor will avoid impacts on individuals of this species to the extent feasible during implementation of the WPF.

• If Congdon’s tarplant is present near the limits of disturbance, the District contractor will maintain a buffer free from construction-related activities around the tarplant occurrence; this buffer will be at least 50 feet if feasible, but large enough to avoid indirect impacts such as dust mobilization and alteration of hydrology. The District contractor shall demarcate the buffer in the field with orange fencing. No equipment, vehicles, or personnel shall be permitted within the buffer area during construction.

• If 15 percent or more of the known population of Congdon’s tarplant within five miles of the WPF area at the time of impact would be affected by the project, the District will provide compensatory mitigation. To compensate for loss of individual Congdon’s tarplants, offsite habitat either occupied by the species or suitable for restoration to support the species and revegetated with this species (such as Sunnyvale Baylands Park) shall be preserved and managed in perpetuity at a minimum 1:1 mitigation ratio (at least one plant preserved for each plant affected). Seeds from the affected population shall be collected and used to seed the mitigation area.

Mitigation Measure WPF-BIO-1b: Prevent the Introduction and Spread of Non-native, Invasive Species

• The District will retain a qualified biologist, or require the contractor to retain a qualified biologist, to develop an Invasive Species Management Plan to reduce the presence and spread of non-native, invasive plant species in the WPF area. The Invasive Species Management Plan shall be developed prior to any grading activities and prior to importing any fill material to the project areas. The overarching goal of this mitigation is to halt the further expansion of existing invasive species and introduction of new invasives into sensitive habitats in WPF areas. The Invasive Species Management Plan shall include, but not be limited to, the following:

  − Prior to construction, the extent and locations of invasive species occurrences will be mapped within all areas proposed to be graded, including access roads and staging areas, and within all sensitive habitats (e.g., wetlands) across the project areas.

  − Areas identified to have weed infestations shall be treated prior to ground disturbance according to weed control methods detailed below:

    ▪ Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods approved for application. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the City of Newark, and implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 72 hours of a scheduled rain event. Where manual and/or mechanical methods are used, disposal of the plant debris will take place at an appropriate offsite location. The timing of the weed control treatment shall be determined for each plant species with the goal of controlling populations before they start producing...
seeds and/or encroach into adjacent areas from rhizomatous shoots. Consultation with a qualified wildlife biologist and plant ecologist shall be required prior to weed control treatments in sensitive habitats with the intent of avoiding any adverse impacts on special-status species in the area.

- Surveying and monitoring for weed infestations shall occur over the course of grading operations. Treatment of all identified weed populations shall occur at a minimum of once annually.

- Once grading ceases, invasive plant populations within all sensitive habitats (such as wetlands) that are not impacted, but that are within 200 feet of grading/construction areas, shall be mapped and the aerial extent and location of invasive populations documented. This shall occur on an annual basis for a minimum of 3 years following grading operations.

  - If, in any monitoring year, the size of existing populations within sensitive habitats expands by 20 percent or more in terms of surface area in comparison to the population size documented prior to construction, the weed control measures described above shall be implemented (inter-annual variation due to climate differences may account for as much as 10 percent of change).

  - During construction activities, all seeds and straw materials used on site shall be weed-free rice straw, and all gravel and fill material shall be certified weed free.

  - During construction activities, vehicles and all equipment shall be washed (including wheels, undercarriages, and bumpers) before entering the project areas. Vehicles shall be cleaned at existing construction yards or legally operating car washes. The project proponent shall document all vehicles have been washed prior to commencing work. In addition, tools such as chainsaws, hand clippers, pruners, etc., shall be washed before entering the work areas.

**Conclusion:** Less than Significant with Mitigation.

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**Impact WPF-BIO-2:** The WPF could result in the loss of or damage to special-status wildlife species, a less-than-significant impact with mitigation.

With respect to WPF improvements implemented at the WPCP, the impacts to special-status wildlife species would be identical to those described for the Master Plan in Impact BIO-2, above, and would be similarly mitigated.

**Construction-related Impacts**

The WPF would be constructed and pipeline installation would occur within currently developed areas (such as roadways) to the greatest extent feasible; however, the precise locations of new WPF groundwater replenishment facilities are currently unknown. Therefore, some potential exists for WPF construction to adversely affect special-status animal species and their habitats if
facilities are located in or cross suitable habitat for these species. Natural habitats that support special-status species in the WPF area, and have a potential to be affected by the WPF, are ruderal/non-native grasslands, riparian forest and woodland, riparian scrub-shrub, broadleaved upland woodland, open water, coastal and valley freshwater marsh, and seasonal wetlands. Special-status wildlife species with potential to occur in these natural habitats in the WPF area include the burrowing owl, western pond turtle, yellow warbler, loggerhead shrike, white-tailed kite, tricolored blackbird, and San Francisco dusky-footed woodrat, as well as several bird species of special concern that occur only as nonbreeding visitors. Potential construction-related impacts on each of these species and their habitats is addressed below.

**Burrowing Owl.** Burrowing owls may winter, and possibly breed, in ruderal grassland habitats on the closed landfill areas. Therefore, pipeline construction associated with the WPF could indirectly impact burrowing owls through disturbance and temporary loss of habitat and could directly affect burrowing owls through loss or abandonment of an occupied burrow, or injury or mortality of owls in burrows, particularly if an active owl nest is present. Due to the recent decline of burrowing owls in the South Bay and the potential importance of owls using the closed landfill areas to burrowing owl recovery, these potential impacts are considered significant in the absence of mitigation. Potential impacts on burrowing owl would be reduced to less-than-significant levels with implementation of Mitigation Measures WPF-BIO-2a (Worker Environmental Awareness Training) and WPF-BIO-2b (Burrowing Owl Measures). For area within the Habitat Plan, conditions developed, and appropriate fees adopted in the Habitat Plan will be applied.

**Western Pond Turtle.** Breeding populations of western pond turtles have been extirpated from much of the Santa Clara Valley due to development, habitat loss, and the introduction of non-native predators. Western pond turtles were not recorded in recharge basins within the portion of the Los Gatos Groundwater Recharge System that is being proposed for use by WPF activities during a recent survey of those basins specifically for this species (HTH, 2012a). However, low numbers of western pond turtle may occur in freshwater streams in the WPF area. Construction activities associated with the WPF could impact western pond turtle if construction of a new pipeline crosses an occupied creek. Potential impacts include temporary habitat loss due to dewatering and trenching within a creek, or direct loss of individuals from the operation of construction equipment and vehicles. Owing to low population sizes of this species within the South Bay, such impacts are potentially significant. Impacts on western pond turtle would be reduced to a less-than-significant level with implementation of Mitigation Measures WPF-BIO-2a (Worker Environmental Awareness Training) and WPF-BIO-2c (Western Pond Turtle Measures).

**Yellow Warbler, Loggerhead Shrike, White-tailed Kite, Tricolored Blackbird, and San Francisco Dusky-footed Woodrat.** The yellow warbler, loggerhead shrike, white-tailed kite, and San Francisco dusky-footed woodrat may all breed in habitat within the WPF area. The loggerhead shrike and white-tailed kite are most likely to nest in the vicinity of the closed Sunnyvale Landfill in the northern portion of the WPF area, as suitably extensive open areas for foraging are absent from the urban landscape that comprises the remainder of the WPF area. Yellow warblers may nest in riparian habitat along freshwater streams in the WPF area, and San
Francisco dusky-footed woodrats may also occur in riparian habitat to be crossed by WPF pipelines. However, neither of these species breeds commonly on the urban Santa Clara Valley floor, as urban riparian habitats typically lack breeding yellow warblers, and the stressors of urbanization (including predation by non-native and urban-adapted predators and habitat fragmentation) have eliminated woodrats from most heavily urbanized areas. As a result, none of these four species occurs as more than an uncommon to rare breeder in the WPF (although yellow warblers are much more abundant during migration).

Although the Habitat Plan identifies potential tricolored blackbird “primary habitat” within portions of the WPF area along Calabazas Creek, Saratoga Creek, and San Thomas Aquino Creek, these creeks do not provide suitable nesting habitat. As a result, tricolored blackbirds only occur in the WPF area as occasional nonbreeding foragers.

WPF construction and implementation would use existing pipelines or new pipelines within developed areas, and attach pipelines to existing stream crossing structures where feasible. Although there is some potential for new pipelines to be constructed at stream crossings using open trench methods, the associated impacts on these five special-status species would be minimal due to the very limited numbers of individuals or pairs that may be present within WPF areas. Therefore, the probability and magnitude (in terms of number of individuals or nests) of impacts on these species are very low, and such impacts are considered less than significant. Furthermore, implementation of Mitigation Measure WPF-BIO-2d (Nesting Bird Measures) would be required for all native birds per Impact WPF-BIO-7, below, which would minimize the potential for impacts on nesting special-status bird species.

**Operation-related Impacts**

Most operation-related impacts associated with the WPF are not expected to adversely affect special-status wildlife species. Given the degree of development and disturbance in the WPF area, and the existing operation and maintenance of water supply activities in the area and associated with the main plant facilities, the amount of disturbance in the WPF area is not expected to increase substantially over existing conditions following construction or implementation of the WPF.

Following WPF implementation, reverse osmosis (RO) concentrate would be disposed of via one of three optional methods currently under consideration: blending it with WPCP effluent and discharging it at the existing shallow water effluent discharge outfall adjacent to the main plant; discharging it via an existing deep water outfall in the San Francisco Bay; or pumping it either to a new treatment wetland engineered within the existing Ponds 1 and 2 following decommissioning or to other locations where wetland restoration is currently in progress, such as Ponds A1/A2W in Mountain View. If RO concentrate is discharged into a deep water outfall, then it would be immediately diluted by bay water, so that it would have a negligible effect on environmental conditions in the bay. If the shallow water discharge option is implemented, then the effluent discharged from the WPCP to the Sunnyvale West Channel (which flows to the Moffett Channel, Guadalupe Slough and eventually San Francisco Bay) could be somewhat greater in salinity than it is currently. The expected salinity level of the RO concentrate (3,100 to 4,500 mg/L) is similar to
that of marine salt water. This has the potential to change the plant and animal communities using the lower Sunnyvale West Channel and Moffett Channel somewhat. However, such impacts would be extremely limited due to dilution with Bay water, and would likely be masked by variability in salinity and plant associations associated with precipitation, fresh runoff from the Sacramento/San Joaquin River Delta (which influences salinity in the South Bay), and other factors. Furthermore, any increase in salinization of tidal marsh plant communities in the Master Plan area, either via discharge into Moffett Channel or into a treatment wetland, could potentially benefit special-status salt marsh-associated species such as the salt marsh harvest mouse, salt marsh wandering shrew, and California Ridgway’s rail. As a result, no substantial impacts on special-status animals are expected to result from increases in the salinity effluent discharges, either due to environmental conditions within the receiving waters or due to changes in habitat.

Constituents of RO concentrate other than salt, such as heavy metals, could be released into sensitive biological communities under any of the RO concentrate disposal options currently under consideration. As noted above, dilution of such substances would occur quickly if RO concentrate were released from a deep water outfall, resulting in no substantive impacts. The release of these RO constituents from a shallow-water outfall or into treatment wetlands could have an impact on sensitive biological resources such as special-status fish and birds that reside in or use the receiving waters, if such constituents produce adverse effects (e.g., toxicity) and if they are present in sufficient concentrations. The City will implement Mitigation Measure WPF-WQ-4 (RO Concentrate Management Study) (refer to Section 4.10, Water Quality) and continue to work with the District and regulatory agencies to complete a concentrate management study that identifies phasing and implementation of concentrate management options that provide for recycled water use, maintain compliance with NDPES requirements for concentrate management, and protect biological resources. Mitigation Measure WPF-WQ-4 would reduce this potentially significant impact on water quality and associated biological resources to a less-than-significant level.

Mitigation Measures

Mitigation Measure WPF-BIO-2a: Worker Environmental Awareness Training

The District will retain, or require the contractor to retain, a qualified biologist to conduct mandatory contractor/worker environmental awareness training for all construction personnel working on WPF activities outside of the main plant. The awareness training will be provided to all construction personnel to brief them on the potential for special-status species to occur on the site, the need to avoid effects to special-status species and their habitats, and all WPF mitigation measures pertaining to biological resources and water quality. If new construction personnel are added, the contractor will ensure that the personnel receive the mandatory training before starting work. A representative will be appointed during the employee education program to be the contact for any employee or contractor who might inadvertently kill or injure a special-status species or who finds a dead, injured, or entrapped individual. The representative’s name and telephone number will be provided to the District prior to the initiation of construction activities outside of the main plant.
Mitigation Measure WPF-BIO-2b: Burrowing Owl Measures

The following measures will be implemented to avoid and minimize impacts on burrowing owls in the WPF area:

- Preconstruction surveys for burrowing owls will be conducted by a qualified biologist prior to all construction activities that occur within 250 feet of potential burrowing owl habitat, in conformance with CDFW protocols. Suitable habitat for burrowing owls is present within 250 feet of the WPF area on the closed landfill to the south of the main plant and along the Sunnyvale West Channel, and additional suitable habitat may also be present within 250 feet of other pipeline construction areas. The final survey will occur no more than 2 days prior to the start of any ground-disturbing activity such as clearing and grubbing, excavation, or grading, or any similar activity within 250 feet of suitable habitat that could disturb nesting owls. If no burrowing owls are located during these surveys, no additional action would be warranted. However, if burrowing owls are located on or immediately adjacent to impact areas, the following measures would be implemented.

- If burrowing owls are present during the nonbreeding season (generally 1 September to 31 January), the District/contractor would maintain a 150-foot buffer zone, within which no new WPF-related activity would occur, around the occupied burrow(s) if feasible. A reduced buffer is acceptable during the nonbreeding season as long as construction avoids direct impacts on the burrow(s) used by the owls. During the breeding season (generally 1 February to 31 August), a 250-foot buffer, within which no new WPF-related activity would be permissible, would be maintained between WPF activities and occupied burrows. Owls present at burrows on the site after 1 February would be assumed to be nesting on or adjacent to the site unless evidence indicates otherwise. This protected area would remain in effect until 31 August, or based upon monitoring evidence, until young owls are foraging independently or until the nest is no longer active.

In the unlikely event that an occupied burrowing owl burrow is within the construction footprint (e.g., on the bank of a levee), and the burrow cannot be avoided, the owl will be evicted from the burrow by a qualified biologist using one-way doors. The biologist will leave the one-way doors in place for at least 48 hours, checking them daily to ensure that they are functioning properly. If the biologist cannot be certain that the owl is outside the burrow (e.g., if the one-way doors were installed when the owl was inside the burrow and the owl cannot be detected outside later), then the burrow will be excavated by hand prior to being filled to ensure that no owl is trapped inside. Otherwise, the burrow will be backfilled after the owl has been evicted. No burrowing owls will be evicted from burrows during the nesting season unless evidence indicates that nesting is not actively occurring (e.g., because the owls have not yet begun nesting early in the season, or because young have already fledged late in the season).

Mitigation Measure WPF-BIO-2c: Western Pond Turtle Measures

The following measures will be implemented to avoid and minimize impacts on western pond turtles in the WPF area:
• Impacts on aquatic habitat of the western pond turtle will be minimized to the extent feasible. Aquatic habitat for this species is present in the Sunnyvale West Channel and may be present in or adjacent to other pipeline construction areas.

• A qualified biologist shall conduct a survey for western pond turtles and their nests immediately (i.e., within 2 hours) prior to commencement of work along the Sunnyvale West Channel. If a western pond turtle is found in an area where it could be injured or killed by WPF improvement activities, the biologist will relocate the turtle to an appropriate site outside the construction area.

• Following the initial survey, a construction crewmember who has been trained to identify western pond turtles by a qualified biologist shall conduct a survey of the work area along the Sunnyvale West Channel area each morning prior to the onset of construction activities. If a turtle is located, all work in the vicinity shall immediately cease, and a qualified biologist shall be contacted. Work within the area shall not resume until the turtle has been relocated or has moved on its own out of the construction area.

• If an active western pond turtle nest is detected within the activity area, a 25 foot-buffer zone around the nest will be established and maintained during the nesting season (April 1 through August 31) until the young have left the nest or it is no longer active due to predation, as determined by a qualified biologist.

**Mitigation Measure WPF-BIO-2d: Nesting Bird Measures**

The following measures will be implemented to minimize impacts on nesting San Francisco common yellowthroat, Alameda song sparrow, and other native bird species:

• Nesting deterrence can be implemented to minimize the potential for nesting birds to constrain project activities or to be adversely affected by those activities. The most effective nesting deterrence in non-developed portions of the main plant is vegetation removal to remove nesting substrate. Vegetation that is to be affected by the project should be removed during the nonbreeding season (i.e., September 1 through January 31) if feasible. If necessary, removal of nest-starts (incomplete nests that do not yet contain eggs or young) by qualified biologists may occur during the breeding season. Such nest-start removal may begin early in the breeding season (e.g., February) and continue regularly until vegetation can be removed and construction commences. Some species, such as barn swallows or black phoebes, may establish nests on buildings or other structures. To deter birds from nesting on structures, netting or other deterrence devices may be installed to preclude birds from constructing nests. Such nesting deterrence should be implemented under the supervision of qualified biologists in order to prevent death or injury of birds as a result of improperly installed deterrence devices, and such devices will require regular maintenance to ensure that they are functioning properly.

• Prior to commencement of new activities (i.e., activities that are not currently ongoing in any given area) during the breeding season (February 1 through August 31), preconstruction surveys will be conducted by a qualified biologist no more than 7 days prior to the initiation of new disturbance in any given area to ensure that no active nests of species protected by the Migratory Bird Treaty Act or California Fish and Game Code will be disturbed during Master Plan implementation. During this survey, the biologist will inspect all potential nesting
4. Environmental Setting, Impacts, and Mitigation Measures

4.7 Biological Resources

habitats (e.g., trees, shrubs, buildings, and various substrates on the ground) in the Project area for nests. Surveys will be conducted within search radii corresponding to disturbance-free buffer zones described below for raptors (300 feet) and non-raptors (100 feet), including in offsite areas adjacent to the Master Plan area (where such areas are accessible).

- If an active nest is found, a qualified biologist will determine the extent of a disturbance-free buffer zone to be established around the nest until nesting has been completed. Disturbance-free buffer zones are typically 300 feet for raptors and 100 feet for non-raptors, although factors such as existing disturbance and vegetation or structures that screen construction activities from a nest will be considered in determining the appropriate buffer. Nests will be considered active until surveys conducted by a qualified ornithologist confirm nesting is complete. However, construction within these radii may proceed if, based on monitoring of the birds' behavior, a qualified biologist determines that such activities are not likely to result in the abandonment of the nest. Pursuant to CDFW recommendations, monitoring will be conducted as follows:
  - A qualified biologist will monitor activity at each nest for three days prior to the onset of construction activities to develop a baseline of the normal behavior of the birds attending the nest. If the behavior observed at the nest is consistent on Days 1 and 2 of monitoring, Day 3 of monitoring may be skipped.
  - A qualified biologist will monitor activity at each nest for 8 hours on the first day that construction occurs within the standard buffer (e.g., within 100 feet of a non-raptor nest). If the biologist determines that the birds' behavior is not adversely affected, WPF activities may continue. The biologist should continue to monitor the nests for 1 hour/day on any day when construction activities occur within the standard buffer around an active nest.
  - If at any time the biologist determines that WPF activities within the standard buffer is adversely affecting the behavior of the birds such that the nest is in jeopardy of failing, construction activities should retreat to honor the standard buffer until the nest is no longer active (i.e., the young have fledged).

Implement Mitigation Measure WPF-WQ-4 (RO Concentrate Management Study).

Conclusion: Less than Significant with Mitigation.

Impact WPF-BIO-3: The WPF could result in the loss of or damage to open water and wetland habitats that are considered Waters of the U.S. and/or State, a less-than-significant impact with mitigation.

With respect to WPF improvements implemented at the WPCP, the impacts to open water and wetland habitats would be identical to those described for the Master Plan in Impact BIO-3, above, and would be similarly mitigated.
The specific pipeline alignments between the main plant, the injection well siting area, and the recharge basins have not been determined for the WPF area. The alignments could potentially affect habitats associated with Calabazas Creek, San Tomas Aquino Creek, Saratoga Creek, and Los Gatos Creek. Although attaching pipelines to existing bridges would be preferred, it is possible that pipelines would have to be installed under streams; if the latter occurs, impacts on open water and wetland habitats could potentially occur at each stream crossing. These impacts could result from excavation and fill of aquatic and wetland habitats, alteration of local hydrology resulting from work within these habitats, and degradation of water quality due to sediment mobilization, leaks of chemicals from construction equipment, or accidental spills during construction. It is expected that the streams crossed by the pipeline would be considered jurisdictional Waters of the U.S./State.

WPF activities at the recharge basins could result in similar impacts on aquatic habitats or wetlands. The recharge basins to which pipelines carry water from streams, or a mixture of water from streams and water from the WPF, would likely be considered jurisdictional by the USACE and RWQCB. However, recharge basins that were excavated in uplands, and contain only water from the WPF facilities, may not be considered jurisdictional by these agencies.

As described above under Impact WPF-BIO-2, WPF activities would include the discharge of RO concentrate, which may result in increases in salinity in receiving waters, as well as water-quality issues associated with increased concentrations of other RO concentrate constituents. However, as described above, such impacts would likely be very local and of low magnitude. Furthermore, implementation of Mitigation Measure WPF-WQ-4 (RO Concentrate Management Study) (refer to Section 4.10, Water Quality) would reduce the potentially significant impact on water quality from release of RO concentrate to a less-than-significant level.

Because any impacts on recharge basins would be to artificial basins and associated habitats, and these impacts would be temporary, impacts on wetlands and waters within recharge basins are not considered significant. However, due to the ecological functions and values provided by streams and wetlands along these streams, impacts on such habitat from WPF activities are potentially significant. Implementation of Mitigation Measures WPF-BIO-2a (Worker Environmental Awareness Training), WPF-BIO-3a (Minimization of Impacts on Water Quality), WPF-BIO-3b (Avoidance of Open Water and Wetland Habitats), WPF-BIO-3c (Compensatory Mitigation for Aquatic and Wetland Habitats), WPF-BIO-8a (Avoidance of Riparian Habitats), and for any impacts on aquatic and wetland habitat within the Habitat Plan boundary, WPF-BIO-9 (Santa Clara Valley Habitat Conservation Plan Compliance) would reduce impacts on jurisdictional aquatic and wetland habitats to less-than-significant levels. Impacts on streams and wetlands within the Habitat Plan boundary would be compensated via payment of appropriate impact fees as described in Mitigation Measure WPF-BIO-9 (Santa Clara Valley Habitat Conservation Plan Compliance) below.
Mitigation Measures

**Mitigation Measure WPF-BIO-3a: Minimization of Impacts on Water Quality**

The following measures will be incorporated into the construction stormwater pollution prevention plan and implemented during construction of the WPF to avoid or minimize impacts on water quality:

- Earth-moving in areas draining to wetlands and aquatic habitats will not occur during days when rain is occurring or predicted to occur (i.e., greater than 30 percent chance) during the work period.

- All permit conditions, legal requirements, and appropriate dredging and engineering practices shall be followed to avoid and minimize water quality impacts associated with Master Plan activities. Suitable erosion control, sediment control, source control, treatment control, material management, and stormwater management BMPs will be implemented consistent with the latest edition of the California Stormwater Quality Association “Stormwater Best Management Practices Handbook,” available at www.capmphandbooks.com.

- Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). Feasible measures shall be implemented to ensure that hazardous materials are properly handled and the quality of aquatic resources is protected by all reasonable means when removing vegetation and sediments from the channels.

- No fueling shall be done in areas immediately adjacent to (i.e., within 50 feet of) channels, ponds, or wetlands. For stationary equipment that must be fueled on site, containment shall be provided in such a manner that any accidental spill of fuel shall not be able to enter the water or contaminate sediments that may come in contact with water. Any equipment that is readily moved out of the channel shall not be fueled in the channel or immediate floodplain.

- A hazardous materials management/fuel spill containment plan will be developed and implemented by the construction contractor and given to all contractors and biological monitors working on the WPF, with at least one copy of the plan located onsite at all times. The purpose of the plan is to provide onsite construction managers, environmental compliance monitors, and regulatory agencies with a detailed description of hazardous materials management, spill prevention, and spill response/cleanup measures associated with the construction of WPF elements. The primary objective of the plan is to prevent a spill of hazardous materials. Elements of the plan will include, but are not limited to the following:
  - A discussion of hazardous materials management, including delineation of hazardous material and hazardous waste storage area, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas;
  - Materials Safety Data Sheets for all chemicals used and stored on site;
  - An inventory list of emergency equipment;
  - Spill control and countermeasures including employee spill prevention/response training;
4. Environmental Setting, Impacts, and Mitigation Measures

4.7 Biological Resources

- Notification and documentation procedures; and
- A monthly reporting plan.

- Vehicles will be checked daily for oil or fuel leaks and will be washed only at an approved area. No washing of vehicles will occur outside of the main plant.

- The work site, areas adjacent to the site, and access areas will be maintained in an orderly condition, free and clear from debris and discarded materials. Personnel will not sweep, grade, or flush surplus materials, rubbish, debris, or dust onto adjacent areas or waterways. Upon completion of work, all building materials, debris, unused materials, concrete forms, and other construction-related materials will be removed from the WPF area.

- Stockpiled materials will be covered by plastic sheeting, tarps, or similar material that can be secured during wind and rain. A sediment fence or berm will be installed around stockpiled dredged material to prevent runoff from transporting sediment into sensitive habitats (such as the channels, ponds, and wetlands). Heavy equipment will not be operated in the active channels or within wetland habitats, but instead from existing hardscape, access roads, and levees.

- Water conservation methods will ensure that water used in the WPF area does not create surface flows capable of carrying pollutants to the nearby creek channel. All personnel, including sub-contractors will be instructed on the practical methods of preventing leaks or over-use of watering, and will be required to adhere to the practices in the detail sheets provided. Woody debris from tree trimming, and other activities will not be left in the active channels or in wetland habitats.

- In-channel vegetation removal may result in increased local erosion due to increased flow velocity. To minimize such erosion, the toe of the bank will be protected by leaving vegetation to the maximum extent practicable.

- Cofferdams or silt fencing will be used to the extent feasible during construction and maintenance activities that could potentially result in substantial siltation of open water. For any work within aquatic or wetland habitats, silt curtains will be installed to prevent suspended sediments from migrating out of the immediate work area, and dredging will be conducted on incoming tides to the extent feasible to further reduce the potential for sediment mobilization outside the Master Plan area. Dredging will be conducted with a closed clamshell-style dredge to reduce the amount of suspended sediment produced. Dredge volumes will be documented to ensure compliance with and adequate performance of these measures.

Mitigation Measure WPF-BIO-3b: Avoidance of Open Water and Wetland Habitats

- Detailed design of the WPF will avoid and minimize impacts on open water and wetland resources to the extent feasible.

- If open water and wetland habitats are present within 100 feet or less of the limits of disturbance in the Master Plan area, avoidance buffers shall be maintained between construction areas and the aquatic resources. These buffers should be at least 50 feet for general construction activities and 100 feet for grading, to the extent feasible. The avoidance buffers shall be designated as Environmentally Sensitive Areas and clearly identified in the field using orange fencing. No equipment, vehicles, or personnel are
permitted within Environmentally Sensitive Areas. Environmentally Sensitive Areas shall be shown on Project plan sets. All Environmentally Sensitive Area fencing shall be maintained intact and in good condition throughout the duration of construction.

- Any temporarily affected aquatic and wetland habitats will be restored to preconstruction elevations and contours, and temporarily affected wetlands will be revegetated using native plant species appropriate for the salinity, elevation, and location of the affected area.

**Mitigation Measure WPF-BIO-3c: Compensatory Mitigation for Aquatic and Wetland Habitats**

The District shall obtain permits from the USACE, RWQCB, and CDFW as needed to obtain authorization to affect jurisdictional waters. In order to ensure that the proposed WPF results in no net loss of wetland and aquatic habitat functions and values, the District shall compensate for the permanent loss of jurisdictional wetland and aquatic habitats through a combination of on-site and/or offsite restoration/creation and protection and enhancement of wetland habitat. The size and location(s) of the area(s) to be restored/created will be determined based on appropriate mitigation ratios derived in consultation with USACE, RWQCB, and CDFW, but the amount of compensatory mitigation provided shall be at least 1:1 (i.e., at least equivalent to the acreage of jurisdictional wetlands and other waters permanently affected). Prior to construction, the District will purchase credits from a mitigation bank approved by the applicable resource agencies and/or prepare a Mitigation and Monitoring Plan describing the proposed creation of mitigation wetlands that will satisfy the mitigation requirements. Impacts on jurisdictional wetlands and other waters may not commence until the adequate credits in a mitigation bank have been purchased and/or the District prepares the Mitigation and Monitoring Plan.

The Mitigation and Monitoring Plan will be prepared by a qualified restoration ecologist and will include the following:

- A summary of wetland impacts and the proposed wetland creation mitigation
- Goals of the restoration to achieve no net loss of habitat functions and values
- The location of the mitigation site and description of existing site conditions
- Mitigation design:
  - Existing and proposed site hydrology, geomorphology, and geotechnical stability, if applicable
  - Grading plan if appropriate, including bank stabilization or other site stabilization features
  - Soil amendments and other site preparation elements as appropriate
  - Planting plan
  - Irrigation and maintenance plan
  - Construction schedule
4. Environmental Setting, Impacts, and Mitigation Measures
4.7 Biological Resources

- Monitoring plan (including specific, objective final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.). Performance criteria will include the establishment of wetland vegetation on any vegetated wetland mitigation area within 5 years of mitigation implementation.

- A contingency plan for mitigation elements that do not meet performance or final success criteria within 5 years; this plan will include specific triggers for remediation if performance criteria are not being met.

Implement Mitigation Measures WPF-BIO-2a (Worker Environmental Awareness Training), WPF-BIO-8a (Avoidance of Riparian Habitats), WPF-WQ-4 (RO Concentrate Management Study), and WPF-BIO-9 (Santa Clara Valley Habitat Conservation Plan Compliance).

Conclusion: Less than Significant with Mitigation.

Impact WPF-BIO-4: The WPF could result in the loss of or damage to protected trees, a less-than-significant impact with mitigation.

With respect to WPF improvements implemented at the WPCP, the impacts to protected trees would be identical to those described for the Master Plan in Impact BIO-4, above, and would be similarly mitigated.

The specific pipeline alignments between the main plant, the injection well siting area, and the recharge basins have not been determined for the WPF groundwater replenishment facilities. The locations of injection wells similarly have not been identified. Construction of pipelines and injection well pads could potentially result in the loss of trees that are protected by local ordinances (protected trees) in the Cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara. The proposed pipelines and injection wells would be constructed by the District. Pursuant to California Government Code Section 53091, the District is not required to comply with local ordinances and therefore would not need to obtain permits for tree removal. However, for purposes of CEQA, this EIR assumes that loss or damage of trees considered protected under local ordinances would be a significant impact. Implementation of Mitigation Measures WPF-BIO-4a (Avoidance and Preservation of Trees), WPF-BIO-4b (Tree Replacement), and WPF-BIO-4c (WPF Mitigation for Impacts on Protected Trees) would reduce this impact to a less-than-significant level.

Mitigation Measures

Mitigation Measure WPF-BIO-4a: Avoidance and Preservation of Trees

During detailed design of Master Plan activities, ordinance-sized trees will be avoided to the extent feasible. If it is determined during detailed design that impacts on some trees can be avoided, a construction-phase Tree Preservation Plan shall be prepared by a certified arborist prior to initiation of construction to describe how trees that will not be removed will be protected. The construction-phase Tree Preservation Plan shall include the
following tree protection measures, which are based on guidelines established by the International Society for Arboriculture:

- Establish an area surrounding individual trees or groups of trees to be protected during construction as defined by a circle concentric with each tree with a radius 1-1/2 times the diameter of the tree canopy drip line. This Tree Protection Zone is established to protect the tree trunk, canopy and root system from damage during construction activities and to ensure the long-term survival of the protected trees. The Tree Protection Zone shall: (1) ensure that no structures or buildings, that might restrict sunlight relative to the existing condition, will be constructed in proximity to the trees; and (2) that no improvements are constructed on the ground around the tree within the Tree Protection Zone, thus ensuring that there is sufficient undisturbed native soil surrounding the tree to provide adequate moisture, soil nutrients and oxygen for healthy root growth.

- Protect tree root systems from damage caused by (a) runoff or spillage of noxious materials while mixing, placing, or storing construction materials and (b) ponding, eroding, or excessive wetting caused by dewatering operations through use of the following measures during excavation and grading:
  - Excavation: Do not trench inside tree protection zones. Hand excavate under or around tree roots to a depth of 3 feet. Do not cut main lateral tree roots or taproots. Protect exposed roots from drying out before placing permanent backfill.
  - Grading: Maintain existing grades within tree protection zones. Where existing grade is 2 inches or less below elevation of finish grade, backfill with topsoil or native site soil. Place fill soil in a single uncompacted layer and hand grade to required finish elevation.
  - Apply 6-inch average thickness of wood bark mulch inside tree protection zones. Keep mulch 6 inches from tree trunks.

- Provide 48-inch tall orange plastic construction fencing fastened to steel T-posts, minimum six (6) feet in length, using heavyweight plastic ratchet ties. Install fence along edges of tree protection zones before materials or equipment are brought on site and construction operations begin. Maintain fence in place until construction operations are complete and equipment has been removed from site.

- Provide temporary irrigation to all trees in protection zones using a temporary on-grade drip or bubbler irrigation system sufficient to wet the soil within tree protection zones to a depth of 30 inches per bi-weekly irrigation event.

**Mitigation Measure WPF-BIO-4b: Tree Replacement**

For WPF areas within Sunnyvale where such avoidance is not feasible, at the discretion of the Sunnyvale Director of Community Development, the District will replace any removed protected trees within Sunnyvale at a 1:1 ratio; if replacement cannot occur, an in-lieu fee will be required.
Mitigation Measure WPF-BIO-4c: WPF Mitigation for Impacts on Protected Trees

For WPF areas outside the city of Sunnyvale, prior to pipeline construction in a given area, the District will require that a survey be performed to identify ordinance-sized trees within the impact area, with “ordinance size” being determined by the ordinance of the city in which the impacts would occur. Such trees will be avoided to the extent feasible following the construction-phase tree protection measures described above under Mitigation Measure WPF-BIO-4a. Where such avoidance is not feasible, the District will replace all affected trees in a manner that is consistent with the local ordinances that protect trees in the city in which the impact occurs. Compensatory mitigation will be provided via tree replacement based upon the number of individual trees removed and/or their size, and further, the trees species that will be affected may also be considered (depending on the tree ordinance of the city in question).

Conclusion: Less than Significant with Mitigation.

Impact WPF-BIO-5: The WPF could result in interference with the movement of native resident or migratory fish or wildlife species, a less-than-significant impact.

With respect to WPF improvements implemented at the WPCP, the impacts to native resident or migratory fish or wildlife species would be identical to those described for the Master Plan in Impact BIO-5, above, and would be less than significant.

A diverse assemblage of urban-adapted native resident and migratory fish and wildlife species use freshwater streams and associated riparian corridors for movement through the Santa Clara Valley. Although WPF implementation would use existing pipelines or new pipelines constructed within developed areas to the greatest extent possible, there is a potential for new pipelines to be constructed at stream crossings using either open trench or trenchless construction techniques (e.g., bore and jack or directional drilling). If new WPF pipelines cross freshwater streams or creeks, then WPF implementation could result in a temporary disruption of creek connectivity during construction. However, streams and associated riparian habitat would be restored to original conditions following construction (refer to Mitigation Measure WPF-BIO-8a, below), and the duration of impacts at any given location would be short enough that disruption of animal movements along urban creeks in the WPF area would be minimal. Therefore, this impact would be considered less-than-significant.

Mitigation: None required.

Impact WPF-BIO-6 (Impacts on nesting birds), corresponding to Impact BIO-6, does not apply to the WPF because impacts on nesting birds at the WPCP and in the WPF area are addressed as part of the analysis of impacts on nesting birds and roosting bats in Impact WPF-BIO-7, below.
Impact WPF-BIO-7: The WPF could result in impacts on nesting birds and roosting bats, a less-than-significant impact with mitigation.

With respect to WPF improvements implemented at the WPCP, the impacts to nesting birds would be identical to those described for the Master Plan in Impact BIO-6, above, and would be similarly mitigated.

Due to the highly urbanized nature of the areas to be traversed by pipelines between the main plant, the injection well siting area, and the recharge ponds, the number and diversity of nesting native birds and roosting bats that could be present in the majority of the pipeline construction area would be low. The bird species present in these urban areas would largely be common, widespread, urban-adapted species. Opportunities for large bat roosts in or near the areas to be adversely affected by pipeline construction would be limited owing to the proposal to place the pipeline within existing roads to the extent feasible, which would limit the proximity of the construction impact area to structures providing suitable bat roosts. As a result, few native nesting birds and roosting bats are expected to be adversely affected by pipeline construction in areas away from bridges.

However, overpasses where roads cross over other roads or railroad tracks, and bridges over creeks, could support larger bat roosts and could potentially support colonies of nesting cliff swallows or white-throated swifts (*Aeronautes saxatilis*), as well as other nesting bird species. Although no special-status bats are expected to occur in such bridges or overpasses due to lack of suitable foraging habitat in such urban locations, more common bat species such as the big brown bat, Yuma myotis, Brazilian free-tailed bat (*Tadarida brasiliensis*), and California myotis (*Myotis californicus*) could roost in soffit vents or crevices in the bridge/overpass structures. Bridges over creeks may also be adjacent to riparian habitat hosting higher numbers and diversity of nesting birds. If the pipeline is attached to bridges and overpasses, or if it is installed beneath creeks, the construction noise, movement of construction personnel and equipment, and physical disturbance of the bridge/overpass structures and vegetation associated with creeks could potentially result in the destruction of bird nests on the bridge or in vegetation; disturbance of nesting birds (possibly to the point of causing nest abandonment); and disturbance of roosting bats (possibly to the point of causing abandonment of young). Although impacts on a small colony of non-special-status bats (i.e., fewer than 10 bats) would not result in a substantial impact to regional populations because of the regional abundance of these species, impacts on multiple colonies, or on a particularly large colony, of these non-special-status bats may substantially impact regional populations. Due to the number of individual birds and bats that could be affected, such impacts are potentially significant.

Implementation of Mitigation Measure WPF-BIO-2d (Nesting Bird Measures) would reduce impacts of pipeline construction around bridges and overpasses, and across creeks, on nesting birds to less-than-significant levels. **Mitigation Measure WPF-BIO-7 (Roosting Bat Measures)** would be implemented to reduce impacts of pipeline construction around bridges and overpasses on roosting bats to less-than-significant levels.
Mitigation Measures

Mitigation Measure WPF-BIO-7: Roosting Bat Measures

The District will implement the following measures to minimize impacts on roosting bats:

- Within 30 days prior to the onset of WPF pipeline work activities on, or within 100 feet of, a bridge or overpass, a qualified biologist will conduct a survey for evidence of bat use. If evidence is observed, or if potential roost sites are present in areas where evidence of bat use might not be detectable, an evening survey and/or nocturnal acoustic survey may be necessary to determine if the bat colony is active and to identify the specific location of the bat colony.

- If an active bat colony consisting of 10 or more bats is determined to be present, the qualified biologist will make one of the following determinations, based on the location of the colony relative to the location and nature of the pipeline construction activities:
  - The work can proceed without unduly disturbing the bat colony, and no additional measures to avoid or minimize impacts are necessary.
  - There is a need for a buffer zone to prevent disturbance to the bat colony, and implementation of the buffer zone (which will be determined on a case-by-case basis by a qualified biologist) will reduce or eliminate the disturbance to an acceptable level.
  - Work cannot proceed without unduly disturbing the bat colony. If this determination is made, the work will not occur during the maternity season (1 April through 31 July) to avoid impacts on maternity colonies.

- If a nonbreeding bat roost (i.e., a non-maternity roost, or a roost occupied between 1 August and 31 March) is found in a structure that must be physically disturbed, the qualified biologist will determine whether eviction of bats is necessary to avoid direct mortality of individuals. If eviction is necessary, the biologist will identify and implement the appropriate eviction measures in consultation with the CDFW.

Conclusion: Less than Significant with Mitigation.

Impact WPF-BIO-8: The WPF could result in the loss of or damage to riparian habitat, a less-than-significant impact with mitigation.

The specific pipeline alignments between the main plant, the injection well siting area, and the recharge basins have not been determined for the WPF area. The alignments could potentially affect riparian habitats associated with Calabazas Creek, San Tomas Aquino Creek, Saratoga Creek, and Los Gatos Creek. It is possible that pipelines would have to be installed through or under streams; if this occurs, impacts on riparian habitat could potentially occur at each stream crossing. Impacts on riparian woodland habitat could result from:

- Disturbance to the root zone and soil compaction from adjacent grading and construction activities
4. Environmental Setting, Impacts, and Mitigation Measures

4.7 Biological Resources

- Changes in soil and hydrologic conditions from increased irrigation and run-off from the construction area, and erosion and sedimentation from construction activities

- Introduction and spread of non-native species due to ground disturbance and transport from construction personnel and equipment.

Impacts on riparian vegetation could degrade the existing habitat value of the streams crossed by pipelines, particularly to wildlife. Due to the ecological functions and values provided by woody riparian habitat, impacts on such habitat from WPF activities are potentially significant. Implementation of Mitigation Measures WPF-BIO-2a (Worker Environmental Awareness Training), WP-BIO-3a (Minimization of Impacts on Water Quality), BIO-8a (Avoidance of Riparian Habitats), BIO-8b (Compensatory Mitigation for Riparian Habitats) and for any impacts on riparian habitat within the Habitat Plan boundary, BIO-9 (Santa Clara Valley Habitat Conservation Plan Compliance) would reduce impacts on riparian habitats to less-than-significant levels.

Mitigation Measures

Mitigation Measure WPF-BIO-8a: Avoidance of Riparian Habitats

- Impacts on riparian habitat will be avoided and minimized to the extent feasible during pipeline installation.

- If riparian habitats are present within 50 feet or less of the limits of disturbance for pipeline installation, avoidance buffers shall be maintained between construction areas and the aquatic resources. These buffers should be at least 30 feet for general construction activities and 50 feet for grading, to the extent feasible. The avoidance buffers shall be designated as Environmentally Sensitive Areas and clearly identified in the field using orange fencing. No equipment, vehicles, or personnel are permitted within Environmentally Sensitive Areas. Environmentally Sensitive Areas shall be shown on WPF plan sets. All Environmentally Sensitive Area fencing shall be maintained intact and in good condition throughout the duration of construction.

- Cutting and trimming of riparian shrubs and trees will be minimized during construction and maintenance activities to the maximum extent feasible. Shrubs that need to be trimmed should be cut at least 1 foot above ground level to leave the root systems intact and allow for regeneration. Removal or trimming of riparian vegetation will be conducted by a certified arborist.

- Any temporarily affected riparian habitats will be restored to preconstruction elevations and contours, and revegetated using native plant species appropriate for the impact area.

Mitigation Measure WPF-BIO-8b: Compensatory Mitigation for Riparian Habitats

If it is determined during the design phase that impacts on riparian habitats cannot be avoided, the District shall obtain permits and approvals from the RWQCB and CDFW. In order to ensure that the proposed WPF results in no net loss riparian habitat functions and values, the District shall compensate for the loss of riparian resources through either on-site restoration/creation and/or off-site protection and enhancement of riparian habitat. The size and location(s) of the area(s) to be restored/created will be determined based on appropriate mitigation ratios derived in consultation with the San Francisco Bay RWQCB.
and CDFW, but the restoration areas shall at least compensate for impacts on woody riparian habitat outside the Habitat Plan area at a 1:1 (mitigation:impact) ratio, on an acreage basis. Note that impacts on riparian habitat within the Habitat Plan boundary will be compensated via payment of appropriate impact fees as described in Mitigation Measure BIO-9 (Santa Clara Valley Habitat Conservation Plan Compliance) below.

Prior to construction, the District will prepare an Mitigation and Monitoring Plan describing the proposed creation of riparian habitat that will satisfy the mitigation requirements. Impacts on riparian habitats waters may not commence until the Mitigation and Monitoring Plan is prepared. The Mitigation and Monitoring Plan will be prepared by a qualified biologist and will include the following:

- A summary of riparian impacts and the proposed riparian creation mitigation
- Goals of the restoration to achieve no net loss of habitat functions and values
- The location of the mitigation site and description of existing site conditions
- Mitigation design:
  - Existing and proposed site hydrology, geomorphology, and geotechnical stability, if applicable
  - Grading plan if appropriate, including bank stabilization or other site stabilization features
  - Soil amendments and other site preparation elements as appropriate
  - Planting plan
  - Irrigation and maintenance plan
  - Construction schedule
- Monitoring plan (including specific, objective final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.). Performance criteria will include at least 30 percent canopy cover by woody riparian vegetation on the mitigation site within 5 years of mitigation implementation, or as required by the applicable permit from the CDFW or other regulatory agencies.
- A contingency plan for mitigation elements that do not meet performance or final success criteria within 5 years; this plan will include specific triggers for remediation if performance criteria are not being met.

**Conclusion:** Less than Significant with Mitigation.

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**Impact WPF-BIO-9:** The WPF could conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan, a less-than-significant impact with mitigation.

The WPF would not conflict with the provisions of a local, regional, or state habitat conservation plan where the WPF area does not overlap with the Habitat Plan area. However, a portion of the potential WPF pipeline alignment and portions of the proposed injection well siting area are
located in the City of San José or along Los Gatos Creek, and thus are in the Habitat Plan area. WPF activities within the Habitat Plan area may therefore be considered covered activities under the Habitat Plan.

A number of biological resources are covered by the Habitat Plan, including streams, wetlands, and riparian habitats. Approval of impacts on these sensitive habitats from project activities covered by the Habitat Plan (i.e., projects that meet a number of criteria concerning location, proponent, and type) would generally be expedited, relative to previous, traditional approvals. Fees paid in accordance with the extent and nature of projects’ impacts are used to further conservation efforts via the acquisition, creation, or enhancement, as well as the preservation and management, of such habitats. In addition, covered projects are subject to a number of measures concerning avoidance and minimization of impacts on covered species and habitats through project design and construction measures.

Potential impacts resulting from the WPF would be minor because the majority of impacts occurring within the Habitat Plan area would be in developed areas. However, non-developed land cover types could be adversely affected if new pipelines cross Calabazas Creek, Saratoga Creek, San Thomas Aquinas Creek, or Los Gatos Creek. Conflicts with the provisions of the Habitat Plan would be considered a significant impact; however, Mitigation Measure WPF-BIO-9 (Santa Clara Valley Habitat Conservation Plan Compliance) would reduce this impact to a less-than-significant level.

**Mitigation Measures**

**Mitigation Measure WPF-BIO-9: Santa Clara Valley Habitat Conservation Plan Compliance**

The District will comply with the conditions of the Habitat Plan by applying conditions of the Habitat Plan for WPF activities that are within the Habitat Plan area and will pay applicable impact fees for those WPF activities, including fees for effects on stream, wetland, and riparian habitats. The Santa Clara Valley Habitat Agency will then use those fees to acquire, preserve, manage, and restore populations of the covered species and the sensitive habitats that are affected by the WPF.

The District will also adhere to all applicable Habitat Plan conditions during WPF implementation. Such conditions may include Conditions 1 (Avoid Direct Impacts on Legally Protected Plant and Wildlife Species), 3 (Maintain Hydrologic Conditions and Protect Water Quality), 4 (Avoidance and Minimization for In-Stream Projects), 12 (Wetland and Pond Avoidance and Minimization), 17 (Tricolored Blackbird), and possibly others. In particular, if WPF pipeline construction necessitates trenching across any streams within the Habitat Plan area, a number of avoidance and minimization measures associated with Condition 4 would need to be implemented.

**Conclusion:** Less than Significant with Mitigation.
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4.8 Geology, Soils, Seismicity, and Mineral Resources

This section describes and evaluates issues related to geology, soils, seismicity, and mineral resources in the context of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan (Master Plan) and Water Purification Facilities (WPF). Discussed are: the physical and regulatory setting; the baseline for determining environmental impacts; the criteria used for determining the significance of environmental impacts; and potential impacts and appropriate mitigation measures associated with implementation of the Master Plan WPCP improvements or WPF.

4.8.1 Setting

4.8.1.1 Physiography

The Master Plan area is located on the margin of the southern end of the San Francisco Bay, which is within the geologically complex California Coast Ranges geomorphic province (California Geological Survey [CGS], 2002a). The Coast Ranges province is characterized by a series of northwest-trending ridges and valleys that run roughly parallel to the San Andreas fault zone, and can be further divided into the northern and southern ranges that are separated by the San Francisco Bay. The San Francisco Bay lies within a broad depression created from an east-west expansion between the San Andreas and the Hayward fault systems. The tectonic forces that dominate the region developed from the margin between the Pacific Plate and the North American Plate where the Pacific Plate slowly creeps northward past the North American Plate on the San Andreas, Hayward, and associated subsidiary faults. The San Francisco Bay and northern end of the Santa Clara Valley are within a structural down-dropped block between the Santa Cruz Mountains to the west and Diablo Mountain Range to the east.

4.8.1.2 Geologic Units

WPCP Master Plan Area

Bedrock in the region of the WPCP is primarily that of the Franciscan Complex, a diverse assemblage of marine-deposited sedimentary and volcanic rocks that were initially deposited hundreds of millions of years ago. These rocks have been folded and faulted extensively and are generally visible in the hills around the San Francisco Bay. Closer to the Bay, in topographically lower areas, the Franciscan bedrock is overlain by more recent sedimentary deposits. The WPCP is located on two of these surficial geologic units. The main plant is located on fine Holocene age alluvial fan deposits, dominated by clay and silt (Witter et al., 2006). The shallow oxidation ponds (Ponds 1 and 2) overlie Holocene San Francisco bay mud, which includes silt, clay, peat, and fine sand at or near sea level in the San Francisco Bay Estuary (Witter et al., 2006).

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1 California’s geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landforms with unique, defining features based on geology, faults, topographic relief, and climate.
Near the ground surface, the majority of the main plant site area consists of artificial fill. Fill in the eastern portion of the site is about 8 to 10 feet thick and consists of clay mixed with sand. In the western portion of the site, fill ranges from 3 to 9 feet thick and includes sandy clay mixed with asphaltic concrete, concrete rubble, metal fragments, and large pieces of rock (Fugro, 2015).

**WPF Groundwater Replenishment Facilities Area (Outside of WPCP Area)**

The WPF groundwater replenishment facilities include injection wells and recharge basins along with either new or existing water pipelines used to carry purified water from the WPCP to the injection wells and recharge basins.

**Surface Geology**

In the location of the proposed injection wells (refer to Figure 3-12 in Chapter 3, *Project Description*), the surficial geologic units include Holocene alluvial fan deposits (sediment from streams of varying sizes, including gravel, sand, silt, and clay), deposited nearer to present-day creeks such as the Calabazas, Los Gatos, and San Tomas Aquinto Creeks, and older Pleistocene alluvial fan deposits. Surface geologic deposits near the recharge basins include natural levee deposits formed when streams overtop their banks and deposit sediment adjacent to the channel (Qhl), gravel quarries and percolation ponds that were or are being used either for the extraction of earth materials or as percolation basins (gq), as well as Holocene alluvium (Witter et al., 2006).

The potential new purified water pipelines from the WPCP to the injection wells and recharge basins would traverse Holocene alluvial fan deposits similar to those in the injection well area.

**Subsurface Geology**

Underlying the surface geology in the Santa Clara Valley described above are many layers of similar sediments, up to 1,500 feet thick in portions of the Valley, on top of bedrock of the Franciscan Complex. In the well injection area the unconsolidated sediments range between 650 and 700 feet deep, below which can be found the mix of Jurassic to Cretaceous (66 to 201 million years old) metamorphic and sedimentary rocks that make up the Franciscan complex (Wentworth et al., 2015). The unconsolidated layers of varying thickness consist of alternating coarse and fine sediments, and are layered almost parallel to the ground surface in the Valley. These sediments have been accumulating in the basin through much of Quaternary time (2.6 million years ago to present). Coarser layers are generally more conductive of groundwater than fine layers.

**4.8.1.3 Mineral Resources**

Minerals are naturally occurring chemical elements or compounds, or groups of elements or compounds that were not formed by organisms. Naturally occurring concentrations of minerals in the earth’s crust are known as mineral deposits. Mineral resources are mineral deposits from which the economic extraction of a commodity (such as gold or copper) is currently potentially feasible. In addition to metallic minerals, materials used for construction (e.g., sand and aggregate), industrial and chemical processes (e.g., salt), and fuel (e.g., crude oil) are considered mineral resources in California.
In accordance with the Surface Mining and Reclamation Act of 1975 (discussed below in Section 4.8.2.2), the California Department of Conservation, Division of Mines and Geology, currently known as the California Geological Survey (CGS), has mapped nonfuel mineral resources of the State to show where economically significant mineral deposits are either present or likely to occur based on the best available scientific data. These resources have been mapped using the California Mineral Land Classification System, which includes the following four Mineral Resource Zones (MRZs):

- **MRZ-1.** Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.

- **MRZ-2.** Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.

- **MRZ-3.** Areas containing mineral deposits, the significance of which cannot be evaluated.

- **MRZ-4.** Areas where available information is inadequate for assignment to any other zone.

The main plant site is mapped as MRZ-1. The WPF groundwater replenishment facilities injection well area also is mapped MRZ-1. Areas where WPF pipelines could be constructed between the WPCP and the injection wells, as well as areas near the groundwater replenishment facilities recharge basins along Los Gatos Creek, are mapped MRZ-3 (Kohler-Antablin, 1996).

Sunnyvale and the cities within which the groundwater replenishment facilities would be located rely upon Santa Clara County to identify mineral resources of regional or statewide significance, and the County in turn uses the MRZ designations identified by the state. The Santa Clara County General Plan identifies mineral resource deposits of regional or state-wide significance, as determined by state agencies. The primary mineral resources of Santa Clara County include construction aggregate deposits and salt derived from evaporation ponds bordering San Francisco Bay (County of Santa Clara, 1994). Construction aggregate generally consists of gravel, sand, and crushed stone. As described above, the geologic units underlying portions of the main plant and the WPF include these materials. While many aggregate quarries are located in the hills to the west of Sunnyvale, no aggregate quarries are located within the Master Plan or WPF areas (Mineral Resources Data Service, 2015). There are no producing, idle, or abandoned oil or gas wells within the Master Plan area or within the WPF injection well field area or near the recharge basins (California Division of Oil, Gas, and Geothermal Resources [DOGGR], 2015). The groundwater replenishment facilities would not be located in or traverse any areas of locally important mineral resource recovery as indicated in the planning documents of the cities of Cupertino, San Jose, Saratoga, and Campbell (City of Cupertino, 2014; City of San Jose, 2007; City of Saratoga, 2007; City of Campbell, 2001).

### 4.8.1.4 Geologic Hazards and Soil Constraints

This section defines and discusses the presence of geologic and soil hazards in the vicinity of the Sunnyvale WPCP and the vicinity of the groundwater replenishment facilities.
Subsidence

Land subsidence is the gradual settling or sudden sinking of the earth’s surface due to subsurface movement of earth materials (U.S. Geological Survey [USGS], 1999). Compaction of subsurface water-containing geologic layers is the primary cause of land subsidence (USGS, 1999). Regional ground subsidence is typically caused by compaction as a result of petroleum or groundwater withdrawal. The soil compacts because the water or petroleum formerly in the pore spaces of sediments or rock is partially responsible for holding the ground up. Loss of this support when the liquid is withdrawn results in consolidation or settlement of the underlying soils. Local subsidence or settlement may also occur when areas containing compressible soils are subjected to foundation or fill loads.

The Santa Clara Plain\(^2\) is vulnerable to land subsidence, with historic subsidence of at least 8 feet in much of the valley and up to 13 feet due to groundwater withdrawal. In 1970 the Santa Clara Valley Water District (District) expanded conjunctive use\(^3\) programs which allowed groundwater levels to rise, halting subsidence. Groundwater levels in the Santa Clara Plain are currently above subsidence thresholds and are actively monitored and managed by the District (SCVWD, 2012). However, as indicated in Chapter 3, Section 3.5.3 (Need for the Water Purification Facilities), the current drought is causing significant declines in the county’s groundwater levels which may lead to irreversible subsidence of the land. Figure 4.8-1 compares historic groundwater levels, land elevation, and population growth in the County. As shown, recent drought conditions are again causing declines in groundwater elevations.

Soils

Overlying the geologic units described above (aside from natural rock outcrops or cuts into bedrock) is a layer of soil that varies in thickness and character. In general, soil characteristics are strongly governed by slope, relief, climate, vegetation and the rock type upon which they form. Soil types are important in describing engineering constraints such as erosion and runoff potential, corrosion risks, and various behaviors that affect structures, such as expansion and settlement. Problematic soils, such as those that are expansive and/or corrosive, can damage structures, improvements and buried utilities and increase maintenance requirements. Table 4.8-1 lists the soil units mapped for the construction disturbance areas associated with the Master Plan and the WPF groundwater replenishment facilities area, and their key physical characteristics. WPCP soils exhibit moderate to high shrink-swell potential and range in corrosion risk from low to high. Soils in the injection well area demonstrate low to high shrink-swell potential, erosion hazard, and corrosion risk.

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\(^2\) The Santa Clara Plain is one of two groundwater management areas the District delineates within the Santa Clara subbasin of the Santa Clara Valley Groundwater Basin, and is the part of the Santa Clara subbasin that underlies the injection well and recharge basin areas.

\(^3\) Conjunctive use is the coordinated management/use of both surface water and groundwater. Generally, conjunctive use includes storage of stream flows in groundwater basins/aquifers during wet years, and use of the stored water during dry years.
supplemental water supplies, and water conservation and recycling. The District also has programs to protect, manage and sustain water resources.

Figure ES-1 shows how the District’s managed recharge programs, imported water deliveries, treated water programs, and other in-lieu recharge have dramatically contributed to a sustainable water supply and have minimized land subsidence in Santa Clara County.

Figure ES-1 History of Groundwater Elevations and Land Subsidence in Santa Clara County

SOURCE: 2012 Groundwater Management Plan

Figure 4.8-1

Groundwater Elevations and Land Subsidence in Santa Clara County
4.8 Geology, Soils, Seismicity, and Mineral Resources

TABLE 4.8-1
SOIL TYPES AND PROPERTIES AT THE WPCP AND THE WPF INJECTION WELL AREA

<table>
<thead>
<tr>
<th>Soil Unit/Sample</th>
<th>Erosion Hazard(^a)</th>
<th>Shrink/Swell Potential(^b)</th>
<th>Risk of Corrosion(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WPCP Main Plant</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boring-01 (near the existing Administrative Building)</td>
<td>N/A</td>
<td>Moderate to High</td>
<td>Low</td>
</tr>
<tr>
<td>Boring-04 (in the existing biosolids drying area, south of the dewatering beds)</td>
<td>N/A</td>
<td>Moderate to High</td>
<td>Moderate to High</td>
</tr>
<tr>
<td>Boring-08 (in the existing sludge drying area, north of the dewatering beds)</td>
<td>N/A</td>
<td>Moderate to High</td>
<td>Moderate to High</td>
</tr>
<tr>
<td><strong>WPF Injection Wells Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban Land – Still</td>
<td>Low to Moderate</td>
<td>Moderate</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td>Urban Land - Elpaloalto</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low to High</td>
</tr>
<tr>
<td>Urban Land - Stevenscreek</td>
<td>Low to Moderate</td>
<td>Moderate to High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Urban Land - Flaskan</td>
<td>Low</td>
<td>Low to Moderate</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td>Urban Land - Landelspark</td>
<td>Low to High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Urban Land - Botella</td>
<td>Moderate</td>
<td>Low to Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

\(^a\) Erosion hazard is rated based on the soil erodibility factor (K), which represents the susceptibility of soil or surface material to erosion, the transportability of the sediment, and the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. The California Water Resources Control Board identifies erosion hazard as low for K values ranging from 0.05 to 0.2, moderate for K values ranging from 0.25 to 0.45, and high for K values ranging from 0.45 to 0.69.

\(^b\) The shrink-swell potential of soils is determined by its linear extensibility, which refers to the percent change in volume as a soil changes from a wet to a dry state. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots, and special design commonly is needed. The table provides the range in values present within the different soil horizons.

\(^c\) “Risk of corrosion” pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete.

SOURCE: Natural Resources Conservation Service (NRCS), 2015a; Fugro, 2015.

Expansive Soils

Expansive soils contain significant amounts of clay particles that have the ability to give up water (shrink) or take on water (swell). When these soils swell, the change in volume can exert significant pressures on loads that are placed on them, such as loads resulting from building and structure foundations or underground utilities, and can result in structural distress and/or damage. Often, grading, site preparations, and backfill operations associated with subsurface structures can eliminate the potential for expansion.

The Uniform Building Code directs that expansive soil tendency be evaluated using the Soil Expansion Potential test (ASTM D-4829). This test evaluates the texture of a soil and how much a sample of the soil expands when wetted to a certain percentage of saturation. The value resulting from this test is called the expansion index, which correlates with expansion potential, ranging from very low potential to very high potential.

Linear extensibility can also be used to estimate the shrink-swell potential of soils. If linear extensibility is greater than three percent (classified as Moderate potential), shrinking and swelling
can cause damage to buildings, roads, and other structures (Natural Resources Conservation Service [NRCS], 2015b).

Expansive soil which may be subjected to volume changes during seasonal fluctuations in moisture content is present at the WPCP and the oxidation ponds. Atterberg limit test results indicated the surficial fill at the WPCP (between 0 to 10 feet) consisting of mostly clay has a moderate to high expansion potential (Fugro, 2015).

Some soils within the groundwater replenishment facilities injection well area exhibit moderate to high soil expansion potential, as shown in Table 4.8-1 (NRCS, 2015a).

**Corrosive Soils**
Corrosion is the deterioration of a metal, concrete, or other material through a reaction with its environment. The corrosivity of soils is commonly related to several key parameters, including soil resistivity, the presence of chlorides and sulfates, oxygen content, and pH. Typically, the most corrosive soils are those with the lowest pH and highest concentration of chlorides and sulfates. Wet/dry conditions can result in a concentration of chlorides and sulfates as well as their movement in the soil, both of which tend to break down the protective corrosion films and coatings on the surfaces of building materials. High-sulfate soils are corrosive to concrete and may prevent complete curing, reducing its strength considerably. Low pH and/or low-resistivity soils can corrode buried or partially buried metal structures. Depending on the degree of corrosivity of the subsurface soils, concrete, reinforcing steel, and bare-metal structures exposed to these soils can deteriorate, eventually leading to structural failures.

Soils at the main plant are moderately to highly corrosive. As shown in Table 4.8-1, soils at the WPCP exhibit sulfate and chloride levels that could corrode concrete and steel, respectively. The detected levels of sulfate at the main plant are sufficient to damage reinforced concrete structures. Chloride ion concentrations in the soil at the main plant are considered corrosive to reinforcing steel (Fugro, 2015). While no borings were taken in the area of the oxidation ponds where construction may occur, the NRCS rates the sediments in the former salt ponds as highly corrosive to concrete and steel (NRCS, 2015c). The corrosion potential of soils in the groundwater replenishment facilities injection well area ranges from low to high (NRCS, 2015a). Standard construction practices and engineering design standards have been developed to address such issues. These practices and standards are further discussed in Section 4.8.3, Impacts and Mitigation Measures, below.

**Soil Settlement**
Settlement can occur from immediate settlement, consolidation, or shrinkage of expansive clay. Immediate settlement occurs when a load from a structure or placement of new fill material is applied, causing distortion in the underlying materials. This settlement occurs quickly and is typically complete after placement of the final load. Consolidation settlement occurs in saturated clay from the volume change caused by squeezing out water from the pore spaces. Consolidation occurs over a period of time and is followed by secondary compression, which is a continued change in void ratio under the continued application of the load. Rapid settlement can occur if soil is liquefied during an earthquake, an effect which is addressed later under Seismic Hazards.
Soils tend to settle at different rates and by varying amounts depending on the load weight and variation in soil properties. This process is referred to as differential settlement. In addition, consolidation and compressibility of the bay muds such as those underlying the oxidation ponds are a well-known phenomenon in Bay Area region. On the main plant site, immediate and secondary compression will be insignificant relative to consolidation settlement, as indicated by the recommendation that site soils be consolidated prior to construction on the main plant site (Fugro, 2015). Moderately compressible clays are present in the main plant area (Fugro, 2015). In addition to naturally occurring compressible materials, a layer of landfill material (consisting of glass, rubber, concrete, bricks, and other materials) approximately 10 feet thick underlies the area of the proposed Administration Building (Fugro, 2015). The material in the groundwater replenishment facilities injection well area is much less compressible alluvium, and thus susceptibility of the well pads and other groundwater replenishment facilities equipment to soil settlement is low. Standard construction practices and engineering design standards have been developed to address such issues. These practices and standards are further discussed in Section 4.8.3, Impacts and Mitigation Measures, below.

**Accelerated Erosion**

Erosion is the wearing away of soil and rock by processes such as mechanical or chemical weathering; mass wasting; and the action of waves, wind, and underground water. If left unprotected, construction sites can erode at rates in excess of one hundred times the natural background rate of erosion (CASQA, 2003). Erosion of disturbed soil at construction sites occurs through rainfall impact, sheet erosion (water flowing in a thin sheet across the soil surface), rill and gully erosion (grooves cut in the soil surface by water moving across the surface, can be one hundred time more effective at eroding soil than sheet flow), and stream and channel erosion. Erosion by wind also occurs at construction sites. Land clearing and grubbing, excavation and other earthwork, drilling and blasting, materials handling (such as moving material to stockpiles), uncovered conveyor transfer, and demolition and debris disposal can all expose soil to erosion by wind.

Excessive soil erosion can eventually lead to damage of building foundations and roadways. During implementation of the Master Plan with or without the groundwater replenishment facilities, areas that are susceptible to erosion are those that would be exposed to wind and water during construction of any of the individual projects. The erosion potential of the soils at the main plant and in the oxidation ponds is low due to the slope of the ground surface at the main plant site and the inundated state of the ponds. At the groundwater replenishment facilities injection well area, the erosion potential of soils ranges from low to high. Typically, soil erosion potential is reduced or eliminated once the soil is graded and covered with concrete, structures, asphalt, or slope protection.

**Slope Failure**

A slope failure is a mass of rock, soil, and debris displaced down a slope under the influence of gravity by sliding, flowing, or falling. Due to the generally flat topography of the main plant and oxidation ponds, large-scale landslides, mudslides, earth flows, or other types of deep-seated landslides are not considered to present geologic hazards for most of the WPCP. However,
material that could slough as a result of excavation has been identified at the main plant site (Fugro, 2015), and relatively steep landfill topography, which includes potentially weak layers of landfill material, is adjacent to areas proposed for excavation. Sediments that could similarly slough are present in the Holocene alluvium underlying the potential pipeline and groundwater replenishment facilities (Witter et al., 2006).

4.8.1.5 Regional Faulting and Seismicity

This section characterizes the region’s existing faults, describes historic earthquakes, estimates the likelihood of future earthquakes, and describes probable ground shaking effects. The primary sources of information for this section were publications prepared by the USGS and the CGS.

Earthquake Terminology and Concepts

Earthquake Mechanisms and Fault Activity

Faults are planar features within the earth’s crust that have formed to release strain caused by the dynamic movements of the earth’s major tectonic plates. When these strains overcome the inherent strength of the earth’s crust, the rock ruptures, causing seismic waves to propagate through the earth’s crust and producing the ground shaking effect known as an earthquake. The rupture also causes variable amounts of slip along the fault, which may or may not be visible at the earth’s surface.

Geologists commonly use the age of offset rocks as evidence of fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault will produce an earthquake, geologists examine the magnitude and frequency of recorded earthquakes and evidence of past displacement along a fault. An active fault is defined by the State of California as a fault that has had surface displacement within Holocene time (last 11,000 years). For the purpose of delineating fault rupture zones, the CGS historically sought to zone faults defined as potentially active, which are faults that have shown evidence of surface displacement during the Quaternary (last 1.6 million years). However, usage of that term under the Alquist-Priolo Earthquake Fault Zoning Act was discontinued because it became apparent that there are so many Quaternary-age faults in the state that it would be meaningless to zone all of them (Bryant and Hart, 2007). In late 1975, the State Geologist made a policy decision to zone only those faults that have a relatively high potential for ground rupture. It was decided that a fault should only be considered for zoning if it is sufficiently active and well-defined.

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4 A fault is deemed sufficiently active if there is evidence of Holocene surface displacement along one or more of its segments or branches. Holocene surface displacement may be directly observable or inferred; it need not be present everywhere along a fault to qualify that fault for zoning.

5 A fault is considered well-defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic or geophysical evidence). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.
Earthquake Magnitude

When an earthquake occurs along a fault, its size can be determined by measuring the energy released during the event. A network of seismographs records the amplitude and frequency of the seismic waves that an earthquake generates. The Richter Magnitude (M) of an earthquake represents the highest amplitude measured by the seismograph at a distance of 100 kilometers from the epicenter. Richter magnitudes vary logarithmically with each whole number step, representing a ten-fold increase in the amplitude of the recorded seismic waves and 32 times the amount of energy released. While Richter Magnitude was historically the primary measure of earthquake magnitude, seismologists now use Moment Magnitude as the preferred way to express the size of an earthquake. The Moment Magnitude scale (Mw) is related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the style of movement or displacement across the fault. Although the formulae of the scales are different, they both contain a similar continuum of magnitude values, except that Mw can reliably measure larger earthquakes and do so from greater distances.

Peak Ground Acceleration

A common measure of ground motion at any particular site during an earthquake is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as a percentage of the constant value of acceleration due to gravity (g) (approximately 980 centimeters per second squared). For comparison purposes, the maximum PGA value recorded during the 1989 Loma Prieta earthquake was 0.64 g in the vicinity of the epicenter near Santa Cruz. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA resulting from an earthquake varies from place to place, depending on distance from the earthquake epicenter and character of the underlying geology (e.g., hard bedrock, soft sediments, or artificial fills).

The Modified Mercalli Intensity Scale

The Modified Mercalli Intensity (MMI) scale (Table 4.8-2) assigns an intensity value based on the observed effects of ground shaking produced by an earthquake. Unlike measures of earthquake magnitude and PGA, the MMI scale is qualitative in nature, meaning that it is based on actual observed effects rather than measured values. Similar to PGA, MMI values for an earthquake at any one place can vary depending on its magnitude, the distance from its epicenter, the focus its energy, and the type of geologic material. The MMI values for intensity range from I (earthquake not felt) to XII (damage nearly total). Intensities ranging from IV to X can cause moderate to significant structural damage. Because the MMI scale is a measure of ground shaking effects, intensity values can be related to a range of average PGA values, also shown in Table 4.8-2.
## TABLE 4.8-2
### MODIFIED MERCALLI INTENSITY SCALE

<table>
<thead>
<tr>
<th>Intensity Value</th>
<th>Intensity Description</th>
<th>Average Peak Ground Acceleration&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Not felt. Marginal and long period effects of large earthquakes.</td>
<td>&lt; 0.0017 g</td>
</tr>
<tr>
<td>II</td>
<td>Felt by persons at rest, on upper floors, or favorably placed.</td>
<td>0.0017–0.014 g</td>
</tr>
<tr>
<td>III</td>
<td>Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.</td>
<td>0.0017–0.014 g</td>
</tr>
<tr>
<td>IV</td>
<td>Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frame creak.</td>
<td>0.014–0.039 g</td>
</tr>
<tr>
<td>V (Light)</td>
<td>Felt outdoors. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.</td>
<td>0.035–0.092 g</td>
</tr>
<tr>
<td>VI (Moderate)</td>
<td>Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster, adobe buildings, and some poorly built unreinforced masonry buildings cracked. Small bells ring (church, school). Trees, bushes shaken (visibly, or heard to rustle).</td>
<td>0.092–0.18 g</td>
</tr>
<tr>
<td>VII (Strong)</td>
<td>Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to some poorly built unreinforced masonry buildings. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks even in better built masonry buildings if not reinforced. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.</td>
<td>0.18–0.34 g</td>
</tr>
<tr>
<td>VIII (Very Strong)</td>
<td>Critical or extensive damage to some buildings, but well-designed buildings are largely undamaged. Steering of motor cars affected. Damage to unreinforced masonry buildings, including partial collapse. There is no damage to well-designed reinforced masonry buildings. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.</td>
<td>0.34–0.65 g</td>
</tr>
<tr>
<td>IX (Violent)</td>
<td>General panic. Damage to masonry buildings ranges from collapse to serious damage unless modern design. Wood frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.</td>
<td>0.65–1.24 g</td>
</tr>
<tr>
<td>X (Very Violent)</td>
<td>Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.</td>
<td>&gt; 1.24 g</td>
</tr>
<tr>
<td>XI (Very Violent)</td>
<td>Rails bent greatly. Underground pipelines completely out of service.</td>
<td>&gt; 1.24 g</td>
</tr>
<tr>
<td>XII (Very Violent)</td>
<td>Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.</td>
<td>&gt; 1.24 g</td>
</tr>
</tbody>
</table>

<sup>a</sup> Value is expressed as a fraction of the acceleration due to gravity. Gravity (g) is 9.8 meters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

Seismic Context

The WPCP and the groundwater replenishment facilities are located within a region of California that contains many active and potentially active faults and is considered an area of high seismic activity (Figure 4.8-2). USGS, CGS, and the Southern California Earthquake Center formed the Working Group on California Earthquake Probabilities to develop an earthquake forecast model for California, which provides estimates of the magnitude, location, and likelihood of earthquake fault rupture throughout the state. The model output summarizes the probability of one or more earthquakes of moment magnitude 6.7 or higher occurring in the state of California over the next 30 years. Accounting for the wide range of possible earthquake sources and for multifault ruptures, it is estimated that the Bay Area as a whole has a 72 percent chance of experiencing an earthquake of magnitude 6.7 or higher before 2045 (Field et al., 2015). According to the working group, the individual faults posing the greatest threat to the Bay Area are the Hayward-Rodger’s Creek fault and the San Andreas fault. Other faults capable of producing significant earthquakes in the Bay Area include the Calaveras, Concord–Green Valley, Marsh Creek–Greenville, and the San Gregorio faults (see Figure 4.8-2).

Table 4.8-3 lists active faults located within 20 miles of the Master Plan area, their distance and direction from the Master Plan area, their maximum moment magnitude earthquake, and the probability that they will generate a major earthquake.

4.8.1.6 Seismic Hazards

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake’s seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Ground rupture is considered more likely along active faults; active faults near the Master Plan area are referenced in Figure 4.8-2 and Table 4.8-3. The highest potential for surface faulting is along existing fault traces that have had Holocene fault displacement. The CGS has produced maps showing Alquist-Priolo Earthquake Fault Zones along faults with known Holocene activity that pose a potential surface faulting hazard. The project areas do not intersect Alquist-Priolo Fault Zones. The potential for surface fault rupture at the site is therefore considered remote.

Ground Shaking

As discussed above, a major earthquake is likely to affect the project area within the next 30 years, and would produce strong ground-shaking effects throughout the region. Earthquakes on active or potentially active faults, depending on magnitude and distance from the project area, could produce a range of ground-shaking intensities. Historically, earthquakes have caused strong ground-shaking and damage in the San Francisco Bay Area, the most recent being the M 6.9 Loma Prieta earthquake in October 1989. The epicenter was approximately 24 miles south of the project area, but this earthquake is estimated to have caused severe (VIII) shaking intensities in the project.
Figure 4.8-2
Faults in the Project Vicinity

SOURCE: USGS and CGS, 2006
TABLE 4.8-3
FAULTS WITHIN 20 MILES OF THE WPCP SITE

<table>
<thead>
<tr>
<th>Fault</th>
<th>Distance and Direction from WPCP</th>
<th>Most Recent Prehistoric Deformation</th>
<th>Fault Classification</th>
<th>Maximum Moment Magnitude Earthquake (Mw)</th>
<th>Earthquake Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monte Vista - Shannon</td>
<td>6.5 miles Southwest</td>
<td>Latest Quaternary</td>
<td>Potentially Active</td>
<td>6.5</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Hayward (South)</td>
<td>6.8 miles Northeast</td>
<td>Historic</td>
<td>Active</td>
<td>6.7</td>
<td>21%</td>
</tr>
<tr>
<td>Hayward (SE Extension)</td>
<td>7.1 miles East</td>
<td>Historic</td>
<td>Active</td>
<td>6.4</td>
<td>7%</td>
</tr>
<tr>
<td>San Andreas (Peninsula)</td>
<td>10.6 miles West</td>
<td>Historic</td>
<td>Active</td>
<td>7.1</td>
<td>7%</td>
</tr>
<tr>
<td>San Andreas (Santa Cruz Mountains)</td>
<td>11.5 miles South</td>
<td>Historic</td>
<td>Active</td>
<td>7.0</td>
<td>9%</td>
</tr>
<tr>
<td>Calaveras (N. of Calaveras Reservoir)</td>
<td>11.6 miles Northeast</td>
<td>Holocene</td>
<td>Active</td>
<td>6.8</td>
<td>7%</td>
</tr>
<tr>
<td>Calaveras Central Section (S. of Calaveras Reservoir)</td>
<td>11.8 miles East</td>
<td>Holocene</td>
<td>Active</td>
<td>5.8</td>
<td>17%</td>
</tr>
<tr>
<td>Sargent Fault (Northwestern Section)</td>
<td>19.8 miles South</td>
<td>Latest Quaternary</td>
<td>Potentially Active</td>
<td>--</td>
<td>1%</td>
</tr>
</tbody>
</table>

\(a\) Defines one of the four time categories in which the most recent prehistoric surface-rupturing or surface-deforming earthquake occurred based on geologically recognizable evidence of faulting, folding, or liquefaction. The categories are (1) Historic (<150 years), 2) latest Quaternary (<15 ka), (3) late Quaternary (<130 ka), (4) late and middle Quaternary (<750 ka), and (5) Quaternary (<1.6 Ma). Note that earthquakes do not always produce recognizable evidence of surface rupture.

\(b\) From Cao et al., 2003.

\(c\) Refers to the probability for one or more magnitude 6.7 or greater earthquakes from 2015 to 2045.


A primary tool that seismologists use to describe ground-shaking hazard is a probabilistic seismic hazard assessment (PSHA). The PSHA for the State of California takes into consideration the range of possible earthquake sources (including such worst-case scenarios as described above) and estimates their characteristic magnitudes to generate a probability map for ground-shaking. The PSHA maps depict values of PGA that have a 10 percent probability of being exceeded in 50 years (1 in 475 chance). This probability level allows engineers to design buildings for ground motions that have a 90 percent chance of not occurring in the next 50-years, making buildings safer than if they were simply designed for the most likely events. The PSHA indicates that at the WPCP, there is a 10 percent chance of exceeding PGA values of 0.494g over the next 50 years (CGS, 2008). As indicated in Table 4.8-2, these PGAs could result in considerable damage even in specially designed structures, causing partial collapse of some buildings and damaging underground utilities. The potential hazards related to ground-shaking are discussed further under the regulatory setting and impact analysis below.
**Liquefaction**

Liquefaction is a transformation of soil from a solid to a liquefied state, during which saturated soil temporarily loses strength as a result of the buildup of excess pore water pressure, especially during earthquake-induced cyclic loading. Soil susceptible to liquefaction includes loose- to medium-density sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Four kinds of ground failure commonly result from liquefaction: lateral spread, flow failure, ground oscillation, and loss of bearing strength. *Lateral spreading* is the horizontal displacement of surficial blocks of sediments resulting from liquefaction in a subsurface layer that occurs on slopes ranging between 0.3 and 3 percent and commonly displaces the surface by several meters to tens of meters. *Flow failures* occur on slopes greater than 3 degrees and are primarily liquefied soil or blocks of intact material riding on a liquefied subsurface zone. *Ground oscillation* occurs on gentle slopes when liquefaction occurs at depth and no lateral displacement takes place. Soil units that are not liquefied may pull apart from each other and oscillate on the liquefied zone. The *loss of bearing pressure* can occur beneath a structure when the underlying soil loses strength and liquefies. When this occurs, the structure can settle, tip, or even become buoyant and “float” upwards. Liquefaction and associated failures could damage foundations, roads, underground cables and pipelines, and disrupt utility service. Of the liquefaction hazards, described above, lateral spreading generally causes the most damage.

The USGS classifies liquefaction susceptibility according to five categories that describe the likely proportion of all liquefaction occurrences that could take place in each category, the abundance or frequency of liquefaction occurrence within the category, the strength of shaking required to produce liquefaction, and the geologic units included (Witter et al., 2006). The five categories are described as:

- **Very High.** The USGS estimates that about 40 to 50 percent of future liquefaction effects would occur within geologic units assigned this category. Only modest ground shaking (peak ground acceleration of about 0.1 g) would be required to cause liquefaction. Geologic map units that fall within this category include the latest Holocene and historical stream channel deposits, as well as artificial fills over bay and other estuarine mud.

- **High.** The USGS estimates that about 20 to 30 percent of future liquefaction effects would occur within geologic units assigned this category. Relatively modest ground shaking (peak ground acceleration of about 0.1 to 0.2 g) would be required to cause liquefaction. Geologic map units within this category include the latest Holocene and historical alluvium, natural levees, and stream terraces.

- **Moderate.** The USGS estimates that about 20 to 30 percent of future liquefaction effects would occur within geologic units assigned this category. Somewhat stronger ground shaking (peak ground acceleration greater than about 0.1 to 0.2 g) would be required to cause liquefaction. Geologic map units within this category include the latest Pleistocene and Holocene bay and other estuarine mud, alluvial fan and levee deposits, and stream terrace deposits.

- **Low.** The USGS estimates that about two percent of future liquefaction effects would occur within geologic units assigned this category. Stronger ground shaking (peak ground acceleration of about 0.5 g) would be required to cause liquefaction. Geologic map units
within this category include basin deposits, various late Pleistocene deposits, and Pleistocene marine terrace deposits.

- **Very Low.** The USGS estimates that about two percent of future liquefaction effects would occur within geologic units assigned this category. Stronger ground shaking (peak ground acceleration greater than about 0.6 g) would be required to cause liquefaction. Geologic map units within in this category include Pleistocene deposits, pre-Quaternary deposits, and bedrock.

Of particular relevance to the WPCP is the fact that liquefaction can occur in unconsolidated or artificial fill sediments and other reclaimed areas along the margin of San Francisco Bay. The depth to groundwater influences the potential for liquefaction, in that sediments need to be saturated to have a potential for liquefaction. As shown on Figure 4.8-3, the main plant and the oxidation ponds occur in areas of moderate to very high liquefaction susceptibility. Liquefaction susceptibility is very high along waterways surrounding the WPCP due to the presence of very shallow groundwater. The groundwater replenishment facilities injection wells would be installed in an area of low to very high liquefaction susceptibility. Similar to the WPCP, areas of very high liquefaction susceptibility within the injection well area run along creek beds, where groundwater and surface water saturate the sediments. Areas of high liquefaction susceptibility along creeks and moderate liquefaction susceptibility around the WPCP are also mapped as Liquefaction Seismic Hazard Zones. The implications of this designation are discussed under the regulatory setting and impact analysis below.

**Earthquake-Induced Settlement**

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, uncompacted, and variable sandy sediments above the water table) due to the rearrangement of soil particles during prolonged ground-shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different amounts). Areas underlain by artificial fill would be susceptible to this type of settlement. Given that the WPCP is constructed on artificial fill, Master Plan components could be subjected to earthquake-induced settlement and the implications of this are discussed further in the impact analysis, below.

**Landslides**

Landslides triggered by earthquakes have historically been a significant cause of earthquake damage. Areas that are most susceptible to earthquake-induced landslides are steep slopes in poorly cemented or highly fractured rocks, areas underlain by loose, weak soils, and areas on or adjacent to existing landslide deposits. The State of California identifies earthquake-induced landslide hazard zones as areas that have either been identified as having experienced landslide movement in the past, or areas where geologic and geotechnical data and analyses indicate that earth material may be susceptible to earthquake-induced slope failure (CGS 2006). The WPCP and groundwater replenishment facilities do not traverse landslide hazard zones (CGS 2001, 2002b, 2004, 2006).
Figure 4.8-3
Seismic Hazards in the Project Vicinity


Sunnyvale Water Pollution Control Plant Master Plan . 120457
4.8.2 Regulatory Setting

4.8.2.1 Federal Regulations

*Occupational Safety and Health Administration Regulations*

Excavation and trenching are among the most hazardous construction activities. The Occupational Safety and Health Administration’s Excavation and Trenching standard, Title 29 of the Code of Federal Regulations, Part 1926.650, covers requirements for excavation and trenching operations. The Occupational Safety and Health Administration requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area.

4.8.2.2 State Regulations

The statewide minimum public safety standard for mitigation of earthquake hazards (as established through the California Building Code [CBC], Alquist-Priolo Earthquake Fault Zoning Act, and the Seismic Hazards Mapping Act) is that the minimum level of mitigation for a project should reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy, but in most cases, is not required to prevent or avoid the ground failure itself. It is not feasible to design all structures to completely avoid damage in worst-case earthquake scenarios. Accordingly, regulatory agencies have generally defined an “acceptable level” of risk as that which provides reasonable protection of the public safety; although it does not necessarily ensure continued structural integrity and functionality of a project (Title 14 California Code of Regulations, §3721(a)). Nothing in these acts, however, precludes lead agencies from enacting more stringent requirements, requiring a higher level of performance, or applying these requirements to developments other than those that meet the acts’ definitions of a “project.”

*Alquist-Priolo Earthquake Fault Zoning Act*

The Alquist-Priolo Earthquake Fault Zoning Act became law in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement. Surface fault rupture is not necessarily restricted to an Alquist-Priolo Zone. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the

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6 Title 14 of the California Code of Regulations (CCR), Section 3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year.

7 Title 14 of the California Code of Regulations (CCR), §3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year.
mapped fault trace, because many active faults are complex and consist of more than one branch. There is the potential for ground surface rupture along any of the branches.

**Seismic Hazards Mapping Act**

The Seismic Hazards Mapping Act of 1990 (Public Resources Code, Chapter 7.8, Section 2690-2699.6) was adopted to reduce the threat to public safety and to minimize the loss of life and property by identifying and mitigating ground failure caused by strong earthquakes, namely liquefaction and slope failure. The Seismic Hazards Mapping Act requires the State Geologist to delineate seismic hazard zones, also known as “zones of required investigation”, where regional (that is, not site-specific) information suggests that the probability of a hazard requiring mitigation is adequate to warrant a site-specific investigation. The fact that a site lies outside a zone of required investigation does not necessarily mean that the site is free from seismic or other geologic hazards. Where a project—defined by the act as any structures for human occupancy or any subdivision of land that contemplates the eventual construction of structures for human occupancy—is within a zone of required investigation, lead agencies must apply minimum criteria for project approval. The most basic criteria for project approval are that the owner/developer adequately demonstrates seismic hazards at the site have been evaluated in a geotechnical investigation, that appropriate mitigation measures have been proposed, and that the lead agency has independently reviewed the adequacy of the hazard evaluation and proposed mitigation measures. Both the geotechnical report and the independent review must be performed by a certified engineering geologist or registered civil engineer. These criteria, along with seismic hazard evaluation and mitigation standards, are outlined in CGS Special Publication 117A, revised and re-adopted in September of 2008 by the State Mining and Geology Board (CGS, 2008).

**California Building Code**

The California Building Code (CBC) has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings and structures within its jurisdiction. The 2013 CBC is based on the 2012 International Building Code published by the International Code Conference. In addition, the CBC contains necessary California amendments which are based on reference standards obtained from various technical committees and organizations such as the American Society of Civil Engineers (ASCE), the American Institute of Steel Construction, and the American Concrete Institute. ASCE Minimum Design Standards 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California. The building department of every city, county, or city and county is required to enforce all the
provisions of the CBC, and is authorized to issue a construction permit for the erection, construction, reconstruction, installation, moving or alteration of any building or structure.

Chapter 18 of the CBC covers the requirements of geotechnical investigations (Section 1803), including excavation, grading, and fills (Section 1804). The CBC requires geotechnical investigations be conducted prior to construction unless waived by the designated building official (which could occur when satisfactory data from adjacent areas demonstrates an investigation is not necessary). Chapter 18 also describes analysis of expansive soils and the determination of the depth to groundwater table. Previously, the Thresholds of Significance in Appendix G of the CEQA Guidelines stated that expansive soil would be characterized as defined in Table 18-1-B of the 1994 Uniform Building Code. However, that table is no longer used and the current CBC definition is as follows:

1803.5.3 Expansive Soil. In areas likely to have expansive soil, the building official shall require soil tests to determine where such soils do exist. Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items 1, 2 and 3 shall not be required if the test prescribed in Item 4 is conducted:

1. Plasticity index (PI) of 15 or greater, determined in accordance with ASTM D 4318
2. More than 10 percent of the soil particles pass a No. 200 sieve (75 micrometers), determined in accordance with ASTM D 422
3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422
4. Expansion index greater than 20, determined in accordance with ASTM D 4829

The CBC also includes earthquake design requirements that take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E (very high seismic vulnerability and near a major fault). Design specifications for individual projects are then determined according to the SDC.

Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act (SMARA) of 1975 (Chapter 9, Division 2, Section 2710 et seq. of the Public Resources Code) requires the State Mining and Geology Board to adopt state policies for reclaiming mined lands and conserving mineral resources. Title 24 of the California Code of Regulations, Division 2, Chapter 8, Subchapter 1 contains these policies.

In accordance with SMARA, the State has established the California Mineral Land Classification System to help identify and protect mineral resources in areas that are subject to urban expansion or other irreversible land uses that would preclude mineral extraction. Protected mineral resources include construction materials, industrial and chemical mineral materials, metallic and rare minerals, and nonfluid mineral fuels.
4.8.2.3 Local Policies

California Government Code section 53091(d) specifies that “Building ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency.” Consequently, many of the facilities included in the Master Plan and WPF are exempt from certain local ordinances. However, the local building agencies of the cities of Sunnyvale, Cupertino, Santa Clara, San Jose, Saratoga, and Campbell retain authority to issue construction permits in compliance with the California Building Code.

City of Sunnyvale General Plan

The City of Sunnyvale General Plan includes the following policy related to seismic hazards:

- **Policy SN-1.1**: Evaluate and consider existing and potential hazards in developing land use policies. Make land use decisions based on an awareness of the hazards and potential hazards for the specific parcel of land.

The General Plan also states that geotechnical reports are required for all developments in the City of Sunnyvale.

As part of the Master Plan, Fugro (2015) conducted a preliminary geotechnical investigation of the site. Information from that report has been used throughout this chapter.

4.8.3 Impacts and Mitigation Measures

4.8.3.1 Thresholds of Significance

For the purposes of this EIR, the project would have a significant impact on geology and soils if it would:

- Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction; and/or
  - Landslides;

- Result in substantial soil erosion or the loss of topsoil;

- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
• Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property;
• Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;

For the purposes of this EIR, the project would have a significant impact on mineral resources if it would:
• Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state; or
• Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

### 4.8.3.2 Approach to Analysis

Impacts related to geologic and seismic hazards would be considered significant if they would cause injury, structural collapse, unrepairable facility or utility damage, or severe service disruption. This analysis assumes that construction and design of proposed facilities would utilize standard site preparation practices, engineering designs, and seismic safety techniques that are required under the CBC and other state and local geologic hazard regulations (see Sections 4.8.2.2 and 4.8.2.3, above). Soil settlements, earthquake shaking, and/or liquefaction would not be considered significant in cases where structural damage would be minor, undetectable, repairable, or would otherwise not pose substantial risk to the public or the environment. Master Plan components that repair or replace existing facilities that are old, deteriorated, built according to outdated building codes, or otherwise have structural impairments would be considered to have a beneficial impact with respect to geologic and seismic hazards.

The following CEQA criteria topics are not discussed further in this section, either because the issue is not applicable to the Master Plan (or specific project components), because there would be no impact, or because the issue is addressed in another section of the EIR. Based on project characteristics and the geologic resources in the area, no impacts are anticipated with respect to the following CEQA criteria topics:

- **Exposure of people or structures to potential substantial adverse effects, including risk of loss, injury, or death resulting from rupture of a known earthquake fault.** No faults zoned under the Alquist-Priolo Earthquake Fault Zoning Act, or any other Holocene-active faults pass through the Master Plan area or the WPF groundwater replenishment facilities area. While the project is located in a seismically active area, and there is no guarantee that fault rupture will only occur in areas demonstrating evidence of past faulting, rupture on faults not identified as active is expected to be less likely (Bryant and Hart, 2007). Therefore, the risk of the project exposing people or structures to loss, injury, or death involving rupture of an earthquake fault would be remote and there would be no impact with respect to fault rupture at the site.

- **Exposure of people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving landslides.** Due to the topography of the Master Plan area
and the groundwater replenishment facilities area, and the lack of evidence of previous landslides in the areas, substantial adverse effects from landsliding are not anticipated for the Master Plan and groundwater replenishment facilities areas and are not further discussed. Small, shallow, localized slumping due to construction excavations is addressed in Impact GEO-2.

- **Substantial soil erosion or loss of topsoil.** The potential for soil erosion and loss of topsoil is comprehensively addressed in Section 4.10, Water Quality, and Section 4.9, Hydrology, both of which analyze and mitigate for the adverse effects runoff and/or WPCP discharges with respect to erosion and sedimentation. In addition, Section 4.2, Land Use, concludes that there would be no impact on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, thereby resulting in no significant impact with respect to loss of topsoil. This CEQA criterion is therefore not further discussed in this section.

- **Soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.** No septic systems (which treat wastewater through ground percolation) are proposed. The Master Plan would entail WPCP improvements and the WPF would entail the installation of injection wells and potentially pipeline construction in addition to new facilities at the WPCP. These projects would not utilize septic systems or alternative wastewater disposal systems for the disposal of wastewater. This CEQA criterion is therefore not applicable to the Master Plan or WPF.

- **Loss of availability of a known mineral resource that would be of value to the region and residents of the state or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.** As discussed in the setting, there are no mineral resources on project sites and thus there would be no impact with respect to mineral resources.

### 4.8.3.3 Impact Summary

Table 4.8-4 lists the project’s geology and soils-related impacts and significance determinations.

<table>
<thead>
<tr>
<th>Impact</th>
<th>GEO-1: Exposure to strong seismic ground shaking.</th>
<th>GEO-2: Problematic soils.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Plans</td>
<td>LS</td>
<td>LS</td>
</tr>
<tr>
<td>Water Purification Facilities</td>
<td>LS</td>
<td>LS</td>
</tr>
</tbody>
</table>

LS = Less than Significant impact, no mitigation required
4.8.3.4 Master Plan Impacts and Mitigation Measures

Impact GEO-1: The Master Plan could result in damage to or failure of structures and/or pipelines due to strong ground shaking or liquefaction during an earthquake, a less-than-significant impact.

Ground shaking is an unavoidable hazard for facilities in the San Francisco Bay Area. The proposed Master Plan facilities would likely experience at least one major earthquake (greater than Moment Magnitude 7) sometime during the operational life of the improved WPCP facilities. The Master Plan Area, including the Bay Trail access relocation, is also underlain by soils that could be subjected to liquefaction ground failures in the event of an earthquake (as the Master Plan Area lies within a Liquefaction Hazard Zone; see Figure 4.8-3). Most structures, including buildings, tanks, roads, paved areas, and impoundments, as well as surface and buried pipelines, are subject to damage from earthquakes and liquefaction.

Ground shaking at the WPCP could cause structural damage to the facility structures or unsecured objects, such as equipment and machinery. The degree of hazard depends on the seismic hazards of the site and on the type of structure, its materials, and construction quality. The intensity of a damaging event will depend on the causative fault and the distance to the epicenter, the moment magnitude, and the duration of shaking. As discussed in the setting, the Master Plan area would have an approximately 1 in 475 annual chance of exceeding a PGA of 0.494g, which is approximately equivalent to an MMI of VIII (Very Strong). This amount of ground shaking could also liquefy the sediments underlying the WPCP, potentially resulting in ground failure and associated structural damage. Compared to the existing WPCP facilities, the proposed improvements would be constructed with newer construction materials and would have greater structural integrity to withstand ground shaking.

The final choice of foundation design, site preparation requirements and construction materials for the WPCP improvements would be informed by soil and/or geotechnical engineering reports to be prepared prior to final designs. Certain WPCP improvements—such as the administration building—would be considered structures for human occupancy (i.e., inhabited for 2,000 hours per year or more). As described above in the setting, the CBC requires that a geotechnical report be prepared unless waived by the local building enforcing agency. A preliminary geotechnical investigation including preliminary information and recommendations regarding seismic hazards at the main plant and oxidation ponds (based on previous studies) was prepared for the Master Plan (Fugro, 2015). This investigation included calculations of seismic design parameters in accordance with Chapter 16 of the 2013 CBC. The preliminary report also indicated that the expected settlement due to liquefaction would be on the order of one inch or less in the western and middle portion of the main plant site, and one to two inches in the oxidation ponds (Fugro, 2015). This report recommends that design-level geotechnical review be performed once plans for the Master Plan have been completed to ensure that seismic and other geologic hazards are addressed in design of the Master Plan improvements. Design-level geotechnical investigations, which must be incorporated into Master Plan improvement design as required by the CBC, would ensure that buildings are designed to reduce the potential for impacts of strong seismic shaking or liquefaction. Because project engineering and design would consider the site-specific...
conditions and seismic setting of the area, potential earthquake-related damage to WPCP facilities would not be expected to result in catastrophic failure, but could include localized leaks and damage to surface conveyance and control structures that could be repaired and would not pose a substantial risk to the public or the environment.

Required compliance with the CBC and the Seismic Hazard Mapping Act would ensure that the impact of the project with respect to seismic ground shaking and liquefaction would be less than significant.

**Mitigation:** None required.

**Impact GEO-2:** The project could result in exposure of structural components and the adjacent landfill to the effects of unstable soil conditions, a less-than-significant impact.

As discussed in the setting, soils within the Master Plan area are prone to a variety of instabilities, including long-term soil settlement (primarily associated with consolidation); settlement resulting from decomposition of landfill materials; and soils with high shrink-swell potential. Groundwater pumping during construction, which would be needed to maintain a dry work surface in excavations at the site, could also result in ground settlement if adequate precautions are not taken (Fugro, 2015). In addition to instability resulting from settlement or expansion, weak soils or landfill materials present within trench excavations for pipelines or building site excavations could fail under gravity if improperly performed resulting in shallow soil slumps, slope failure, or sloughing of adjacent areas, including the landfill south of the main plant site.

If these unstable soil conditions are not taken into consideration in construction site preparation activities (i.e., grading) and in the design of proposed structures, unstable soils (including instability caused by decomposition of underlying landfill materials) could have significant impacts on structural components of the Master Plan. Improperly designed structures could be subject, in the long term, to damage or distress as a result of adverse soil conditions, resulting in the need for frequent and potentially costly repairs, and in severe cases, could hinder or constrain the ability of WPCP improvements to function as intended. Differential settlement along linear project components (i.e., pipelines or roads) or beneath flat, rigid foundations (e.g., concrete slabs on grade), if not properly accounted for in the design of proposed improvements, would have the greatest potential to cause structural problems in the long term. Potential impacts due to unstable soils on the site would be limited to the facility itself and would not result in an increase in geologic hazards for the general public or offsite properties as the WPCP is separated from public use areas (such as the Bay Trail and SMaRT Station®) by waterways.

The ground instability issues discussed in the setting are common in the Bay Area, particularly within bay mud deposits or in areas where past filling of the Bay has occurred, and standard engineering solutions have been developed to effectively address such concerns. Commonly employed solutions include over-excavation and replacement with engineered fills, lime treatment,
moisture conditioning, proper compaction of base and sub-base soils, use of appropriate constructions materials, and appropriate selection and design of foundations, among others.

A geotechnical study has been prepared for the Master Plan by Fugro (2015), which evaluates geologic hazards at the main plant and Ponds 1 and 2 and provides recommendations to address unstable soil conditions at the WPCP, in accordance with current geotechnical practices and building codes. as required for compliance with the CBC. As described in Section 4.8.1, incompetent soils may be encountered in the oxidation ponds, along the access road, and in the area beneath the proposed Administration Building. To address soil settlement in the oxidation ponds and along the access road, adequate foundation structures, such as cement pilings or driven concrete piers, would be installed under structures, and access road widening would be staged to ensure adequate consolidation of the underlying bay mud. In order to found the Administration Building on stable soils, either landfill materials underlying the location of the Administration Building would be removed and replaced by engineered fill prior to foundation construction, or piers would be drilled through the landfill materials to underlying native soil.

The geotechnical study also includes groundwater controls to be implemented during construction, which are designed to limit the extent of influence of construction dewatering. These groundwater controls would reduce the effect of the Master Plan on surrounding groundwater, thus reducing the potential for soil settlement as a result of the Master Plan.

Temporary excavations in unstable soils or deeper than 5 feet (such as excavation to remove landfill materials beneath the proposed Administration Building) would be shored and sloped in accordance with OSHA standards. In accordance with Cal/OSHA requirements, the applicant and/or its contractor will, before beginning any excavation or trench work five feet or more in depth, secure a permit "to perform Excavation or Trenchwork," from the State of California, Division of Industrial Safety. Excavation for any trench five feet or more in depth cannot begin until completion of review by the Engineer of the Contractor's detailed plan for worker protection from the hazards of caving ground during the excavation of such trench. Such plan must be submitted at least five days before the Contractor intends to begin excavation for the trench and must show the details of the design of shoring, bracing, sloping, or other provisions to be made for worker protection during such excavation. No such plan can allow the use of shoring, benching, sloping or a protective system less effective than that required by the Construction Safety Orders of the Division of Occupational Safety and Health and if such plan varies from the shoring systems standards established by the Construction Safety Orders, the plan must be prepared and signed by an engineer who is registered as a Civil or Structural Engineer in the State of California. In addition, shoring would be rigid to limit adverse effects on adjacent structures or, in the case of the Administration Building, the adjacent landfill. The landfill is visually monitored either monthly (during the wet season) or quarterly (during the dry season) for erosion or differential subsidence, as required under state landfill closure regulations (27 CCR et seq.), and the landfill postclosure maintenance plan includes required actions to be implemented in the cases of minor or major slope failure in order to protect public health and the environment (SCS Engineers, 2012).
Implementation of geotechnical recommendations would be required pursuant to the CBC, and landfill postclosure maintenance is required under 27 CCR et seq. Required compliance with the CBC, landfill closure requirements, and Cal/OSHA requirements would ensure the impact of Master Plan implementation would be less than significant.

**Mitigation:** None required.

### 4.8.3.5 Water Purification Facilities Impacts and Mitigation Measures

**Impact WPF-GEO-1:** The WPF could result in damage to or failure of utility lines due to strong ground shaking or liquefaction during an earthquake, a less-than-significant impact.

As described in Impact GEO-1, above, ground shaking is an unavoidable hazard for facilities in the San Francisco Bay Area. The proposed Water Purification Facilities (WPF) at the WPCP, water pipelines, and injection wells would likely experience at least one major earthquake sometime during the operational life of these facilities. This amount of ground shaking could also liquefy the sediments underlying the WPCP, potentially resulting in ground failure and associated structural damage. Broken pipelines could result in soil washout and sinkholes that could damage nearby non-project facilities or the environment. Locating and repairing damaged pipelines could require a temporary cessation of operation of the facilities for a significant period of time.

In comparison to aboveground structures, underground pipelines, and buried structures are generally less susceptible to liquefaction damage because they are imbedded in compacted backfill that can tolerate more seismic wave motion. While this practice would not completely eliminate the potential for damage to the facilities, it would ensure that the resultant improvements would have the structural fortitude to withstand anticipated ground shaking and seismically induced ground failures without significant damage.

The discussion below addresses the impacts associated with the individual WPF infrastructure components.

**WPF at the WPCP**

WPF at the WPCP would be exposed to the same ground shaking and liquefaction risks as identified for the Master Plan facilities, discussed in Impact GEO-1, above. As discussed in the setting, the Master Plan area would have an approximately 1 in 475 annual chance of exceeding a PGA of 0.494g, which is approximately equivalent to an MMI of VIII (Very Strong). The final choice of foundation design, site preparation requirements and construction materials for the WPF at the WPCP would be informed by soil and/or geotechnical engineering reports to be prepared prior to final designs. Damage to WPCP facilities could include localized leaks and damage to surface conveyance and control structures. Required compliance with the CBC would ensure that the impact of the project with respect to seismic ground shaking and liquefaction would be less than significant.
Groundwater Replenishment Facilities - Water Pipelines

As described in the Chapter 3, Project Description, the groundwater replenishment facilities would include the potential installation of pipelines from the WPCP to the proposed injection well area and existing recharge basins. During an earthquake, underground utilities tend to fail at the interface between a softer unit and a stiffer unit owing to the settlement that occurs within the softer unit, a phenomenon known as “differential settlement.” Differential settlement is a concern because it can cause the uneven vertical movement of pipelines, resulting in substantial damage including cracks and breakage. Soils underlying the potential pipelines include varying amounts of artificial fill, and several native soil units and may be prone to a variety of instabilities, such as liquefaction and slope instability, which could be triggered by strong seismic ground shaking. As discussed in Section 4.8.1, the proposed pipelines would be exposed ground shaking similar to or more intense than the shaking expected at the WPCP, and traverse areas of moderate liquefaction susceptibility, including areas mapped as Liquefaction Hazard Zones.

As described in Section 4.8.3.2, Approach to Analysis, impacts would not be considered significant in cases where structural damage would be minor, detectable, repairable, or would otherwise not pose substantial risk to the public or the environment. The soils identified within the project area are common in the Bay Area and standard engineering solutions have been developed to effectively address seismic hazards. Underground pipelines would be imbedded in structural fill and would be constructed in accordance with design standards such as the American Water Works Association (AWWA, 2004) standards for design and installation of steel pipe, standards of the American Society of Mechanical Engineers, and standards of the American Welding Society for structural welding. Industry-accepted pipeline installation standards that prescribe requirements for depth, connections, bedding, backfill, and compaction would ensure that the pipelines are installed properly to avoid damage caused by settlement, cracking or expansion. Commonly employed solutions for construction in liquefaction risk zones include over-excavation and replacement with engineered fills, lime treatment, moisture conditioning, proper compaction of base and sub-base soils, use of appropriate constructions materials, and appropriate selection and design of foundations, among others. Additionally, pipelines would incorporate materials and design to minimize breakage. Construction of the pipelines in accordance with the design standards described above would ensure that impacts associated with seismic-related ground failure, including liquefaction, would be less than significant.

Groundwater Replenishment Facilities Injection Wells

The groundwater replenishment facilities would also include installation of injection wells in an approximately 2,600 acre area. The wells would include well pads, connection piping to the wells, and well heads and casings. The District regulates the construction and destruction of wells in the Santa Clara Valley based on the District’s “Standards for the Construction and Destruction of Wells and Other Deep Excavations in Santa Clara County” and the “California Well Standards,” which apply to all water wells including injection wells. All well construction in Santa Clara County is required to comply with District well standards and the Department of Water Resources well standards identified in Water Resources Bulletin 74-81, pursuant to District Ordinance 90-1. No businesses or residences would be constructed as part of these facilities, and
people would not regularly access these facility sites upon completion of the groundwater replenishment facilities. Thus damage during earthquakes would be limited to damage to the pipelines, well pad, head, and casing. Damage to these components could result in the unintended release of water aboveground, which could generate excessive erosion or property damage. Similar to the purified water pipelines described above, however, this damage would be repairable. Construction of the injection wells and connector pipelines in accordance with the District and state standards described above would ensure that impacts associated with seismic-related ground failure, including liquefaction, would be less than significant.

**Groundwater Replenishment Facilities - Recharge Basins**

Minimal new construction would occur in the area of the recharge basins, which are already constructed and operational as groundwater recharge basins. The basins are intermittently filled with water. The recharge basins are located in the Santa Clara Plain recharge area, an area of high permeability sands and gravels that allow surface water to infiltrate into the groundwater. The WPF would not alter the existing use of these ponds for recharge, and thus would not change the existing ground shaking and liquefaction risks at the basins. Impacts of the use of the recharge basins with respect to seismic ground shaking and liquefaction would be less than significant.

**Mitigation:** None required.

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**Impact WPF-GEO-2: The WPF would result in exposure of structural components to the effects of unstable soil conditions, a less-than-significant impact.**

The discussion below addresses the unstable soil impacts associated with the individual WPF infrastructure components. As the WPF would use the existing recharge basins for their current purpose and no new structures would be installed as part of that component, there would be no impact to the recharge basins from unstable soils conditions.

**WPF at the WPCP**

As discussed in Impact GEO-2, above, soils within the WPCP site are prone to a variety of instabilities, including long-term soil settlement (primarily associated with consolidation); soils with high shrink-swell potential; settlement resulting from decomposition of landfill materials; and the possibility of shallow, small-scale sloughing or slumping of soils in subsurface excavations. If these unstable soil conditions are not taken into consideration in construction site preparation activities (i.e., grading) and in the design of proposed structures, unstable soils could have potentially significant impacts on structural components of the WPF at the WPCP. However, as with any municipal construction project, compliance with the CBC would be required, which includes the preparation of a geotechnical report prior to approval of a building permit by the local building enforcing agency. The geotechnical report would include appropriate measures to be incorporated into the WPF design to correct the shrink-swell and/or compressible soil conditions, in accordance with current geotechnical practices and building codes.
Weak soils present within trench excavations for pipelines or WPF building site excavations could fail under gravity if improperly performed, resulting in shallow soil slumps or sloughing. As described in Impact GEO-2, above, in accordance with Cal/OSHA requirements, the City and/or its contractor will, before beginning any excavation or trench work five feet or more in depth, secure a permit "to perform Excavation or Trenchwork," from the State of California, Division of Industrial Safety. To secure the permit, a worker safety plan must be prepared and signed by an engineer who is registered as a Civil or Structural Engineer in the State of California prior to excavation.

The purpose of the construction and excavation permits is to ensure the proposed project complies with all relevant building codes, local ordinance codes, and local and state geologic hazard regulations. Because the WPF at the WPCP would not be approved without such permits, the impact is less than significant, and no additional mitigation is required.

Groundwater Replenishment Facilities Water Pipelines
Depending on the depth of buried pipelines, soil in expansion or contraction could lead to lateral pipeline stress and stress of structural joints. Lateral stresses could, over time, lead to pipeline rupture or leaks in the coupling joints. Shrinkage cracks could form in native soils adjacent to the pipeline trench or in backfill material if expansive soils are used. If shrinkage cracks extend to sufficient depths, groundwater can infiltrate into the trench, causing piping (progressive erosion of soil particles along flow paths) or settlement failure of the backfill materials. Settlement failure can also occur if expansive soils are used in backfill and undergo continued expansion and contraction. Over time these soils could settle, resulting in misalignment or damage to buried facilities.

However, as described in Impact GEO-2, above, underground pipelines would be imbedded in structural fill and would be constructed in accordance with industry standards used to minimize the effects of expansive soils on pipelines. Although expansivity in a soil can cause damage to structural features, there is a low potential for this to occur in an appropriately engineered soil base. Soil expansivity along the water pipelines would thus pose a low risk to the public or the environment, and the installation of the pipeline would be a less-than-significant impact in this regard.

Groundwater Replenishment Facilities Injection Wells
Unless properly removed or reconditioned during construction, expansive soils could exert additional pressures on concrete slabs and below-grade facilities, producing shrinkage cracks that allow water infiltration and compromise the integrity of backfill material. The effects of expansive soils could damage concrete slabs and well casings, and result in the unintended release of water aboveground. However, as described above, the wells would be constructed according to state and District standards, including the replacement of soil surrounding the well head with sealing materials such as cement. Compliance with existing construction standards would ensure that impacts of well construction in expansive soils would be less-than-significant.

**Mitigation:** None required.
4.8.4 References


4.9 Hydrology

This section describes and evaluates issues related to hydrology in the context of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan and Water Purification Facilities (WPF). Water Quality impacts related to changes in WPCP discharge and treated water use are addressed in Section 4.10, Water Quality. Discussed below are the physical and regulatory setting, the baseline for determining environmental impacts, the criteria used for determining the significance of environmental impacts, and potential impacts and appropriate mitigation measures associated with implementation of the Master Plan or WPF.

4.9.1 Setting

4.9.1.1 Climate

The San Francisco Bay Area experiences a Mediterranean climate characterized by mild, wet winters and dry, warm summers. Air temperatures are mild and seldom below freezing due to proximity to the ocean. Winter weather is dominated by storms from the northern Pacific Ocean that produce nearly all the annual rainfall, while summer weather is dominated by sea breezes caused by differential heating between the hot interior valleys and the cooler coast. The prevailing wind direction is from the west to northwest in the late spring through early fall, with more variable conditions in the winter.

The South Bay typically receives about 90 percent of its precipitation in the fall and winter months, with the greatest average rainfall occurring in January. The average annual rainfall in the counties surrounding the South Bay is approximately 20 inches, although the actual rainfall can be highly variable due to annual or longer-duration large-scale deviations in ocean and atmospheric temperature (El Niño and La Niña) and the influence of local topography.

4.9.1.2 Tides

Tides move as shallow water waves through the narrow opening at the Golden Gate, and are modified by bottom bathymetry,1 shoreline and the Earth’s rotation as they move through the estuary. The enclosed nature of the South Bay creates a mix of progressive and standing wave behavior, where waves are reflected back upon themselves, causing an amplification of the tidal wave and an increase in tidal range with distance from the Golden Gate (U.S. Army Corps of Engineers [USACE], 2014).

The tides in San Francisco Bay are mixed semidiurnal, with two high and two low tides of unequal heights each day. The tides exhibit strong spring-neap variability, with the spring tides (larger tidal range) occurring approximately every two weeks during the full and new moon. Neap tides (smaller tidal range) occur approximately every two weeks during the moon’s full quarter phases. The tides also vary on an annual cycle, in which the strongest spring tides occur in late spring/early summer and late fall/early winter, and the weakest neap tides occur in spring and fall.

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1 The shape of the ocean or bay floor.
Moffett Channel and Guadalupe Slough both are tidally influenced (Santa Clara Valley Water District [SCVWD], 2013a). The oxidation ponds, SCVWD Pond A4, and Cargill Channel are all isolated from tidal action by levees.

The National Oceanic and Atmospheric Administration (NOAA) collects tidal data from numerous tidal gauges around the country. The nearest tidal gauge with historic tidal data collected by NOAA is located at the confluence of Alviso Slough and Coyote Creek, approximately one mile from the mouth of Guadalupe Slough. Table 4.9-1 contains measured tidal datums for the Coyote Creek station, approximately three miles north of the main plant site. The U.S. Army Corps of Engineers (USACE, 1984) estimated extreme storm tides in the South Bay, shown in Table 4.9-1.

<table>
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<tr>
<th>Tide</th>
<th>Feet MLLW</th>
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<th>Feet NGVD 29c</th>
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</tr>
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</table>

a Tides are for 1983-2001 tidal epoch at National Oceanic and Atmospheric Administration station #9414575; MLLW = mean lower low water; NAVD 88 = North American Vertical Datum, 1988; NGVD29 = National Geodetic Vertical Datum, 1929.

b MLLW – NAVD 88 conversions are from Foxgrover et al. 2007.

c NGVD 29 elevations converted to NAVD 88 by adding 2.74 feet (City of San Jose, 2013. San Jose/Santa Clara Water Pollution Control Plant Master Plan First Amendment to the Draft EIR).


4.9.1.3 Tsunamis and Seiches

A tsunami is a series of traveling ocean waves generated by an abrupt disturbance of the ocean surface, usually by large, shallow focus earthquakes. Tsunamis can travel at speeds of up to 700 miles per hour, and wave heights when they reach the shore can exceed 100 feet. The impact of a tsunami depends on many factors including the magnitude of the disturbance and the topography, both off-shore and on-shore. Low-lying coastal areas such as tidal flats, marshlands, and former bay margins that have been artificially filled but are still at or near sea level are generally the most susceptible to tsunami inundation. A seiche is caused by oscillation of the
surface of an enclosed body of water, such as reservoirs, as a result of an earthquake or large wind event. Seiches can result in long-period waves that cause run-up or overtopping of adjacent landmasses, similar to tsunami run-up.

The San Francisco Bay has been affected by multiple historical tsunamis, as recorded by the oldest continuously operating tide gauge station in the United States (first installed in 1854; Uslu et al., 2010). Local tsunamis are caused by landslides or earthquakes. Since the topography of the Bay is generally gently sloped and there is no history of large in-Bay landslides, any landslide-caused tsunami would likely be small and quickly dissipate offshore. Since the characteristic seiche periods of the Bay are significantly longer than surface wave periods for waves caused by earthquakes, earthquake-caused local tsunamis are not considered to pose a hazard to the WPCP area (Borrero, et al., 2006). When a suite of tsunami events, including local tsunamis and teletsunamis, were modeled, the combined upper bound of tsunami inundation at mean high water reached approximately 2.5 miles downstream of the oxidation ponds along Guadalupe Slough (CalEMA, 2009). No inundation was expected within the WPCP site (CalEMA, 2009).

4.9.1.4 Surface Waters

Master Plan

Surface water features near the Master Plan include the Sunnyvale East and West Channels, Moffett Channel, Cargill Channel, and SCVWD Pond A4 (shown on Figure 3-2). These features are part of the 85-square mile West Valley Watershed in Santa Clara County.

Moffett Channel and Sunnyvale West Channel

Moffett Channel is located adjacent to and north of the main plant site. Effluent from the WPCP is discharged into Moffett Channel. The WPCP is at the downstream end of Moffett Channel Watershed, which drains a 7.6 square mile area of urbanized flatlands via the Sunnyvale West Channel (SCVWD, 2012; SCVWD, 2013a). The Sunnyvale West Channel drains directly into Moffett Channel, and when needed stormwater collected in engineered channels adjacent to the WPCP is pumped into Moffett Channel through a stormwater pump station located adjacent to the northeastern corner of the WPCP. Moffett Channel winds between the oxidation ponds and SCVWD Pond A4 to connect with Guadalupe Slough, which drains to the southern portion of the San Francisco Bay. Moffett Channel and the Sunnyvale West Channel are tidally influenced from Guadalupe Slough to near North Pastoria Avenue (SCVWD, 2013a; SCVWD 2015). The Sunnyvale East and West Channels were developed to manage flooding in Sunnyvale, and were not natural creeks prior to urbanization. During the first half of the 20th century, groundwater withdrawals in the area led to 8-10 feet of land subsidence, which exacerbated flood hazard in the area. The Sunnyvale East and West Channels were created to drain areas that ponded during storm events (SCVWD, 2013a). The southernmost extent of the Moffett Channel Watershed is located north of West Remington Drive between Hollenbeck Avenue and South Mary Avenue in Sunnyvale (SCVWD, 2012). South of U.S. Highway 101, stormwater drains to the engineered Sunnyvale West Channel primarily via underground storm drains or culverts (SCVWD, 2012).
Both the Sunnyvale West and East Channels receive urban stormwater runoff and do not have instream impoundments or detention features (SCVWD, 2012). As a result, water drains rapidly and water levels rise and fall quickly in the channels following rainfall.

**Sunnyvale East Channel**

Sunnyvale East Channel is located approximately 0.5 mile east of the WPCP. The Sunnyvale East Channel runs parallel to Sunnyvale West Channel, and drains an area of approximately 7.25 square miles of urbanized flatlands in Sunnyvale and Cupertino (SCVWD, 2012; SCVWD, 2013a). Water from the Sunnyvale East Channel flows directly into Guadalupe Slough, and is tidally influenced from Guadalupe Slough upstream to approximately halfway between Tasman Drive and U.S. 101 (SCVWD, 2013a). The headwaters of the Sunnyvale East Channel watershed are located to the north of Interstate 280 between State Route 85 and Finch Way (SCVWD, 2012).

Mean high tide extends to approximately State Route 237 on the Sunnyvale East Channel (SCVWD, 2013a).

**Cargill Channel**

The Cargill Channel is separated from the main plant by the Sunnyvale West Channel/Moffett Channel, and extends west from Moffett Channel around Pond 1 to Salt Pond A3W. The Cargill Channel is contained within levees and was formerly used as a salt pond.

**SCVWD Pond A4**

Similar to the Cargill Channel, SCVWD Pond A4 is surrounded by levees and does not directly receive surface water from the Bay, Moffett Channel, or Sunnyvale East Channel. However, water can be siphoned from Cargill Channel to Pond A4, and it is likely that Pond A4 is hydrologically connected by groundwater to neighboring surface water bodies (SCVWD, 2013a). The water in SCVWD Pond A4 is managed by the District in response to water quality concerns by pumping water out of the Pond, drawing in water from Cargill Channel (SCVWD, 2013a).

**Water Purification Facilities**

Surface water bodies near the Water Purification Facilities (WPF) are located in the West Valley Watershed and the 170-square mile Guadalupe Watershed. Hydrologic features in the vicinity include Calabazas Creek, Saratoga Creek, San Tomas Aquino Creek, and Los Gatos Creek and Recharge Basins. Los Gatos Creek and Recharge Basins are part of the Guadalupe Watershed. These creeks are shown on Figure 4.9-1.

**Calabazas Creek**

Calabazas Creek flows through the northwestern portion of the well injection area. The Calabazas Creek watershed drains approximately 20 square miles of land from the Santa Cruz Mountains in the south to lands just south of the San Francisco Bay. Tributaries located south of State Route 85 and in the foothills of the Santa Cruz Mountains are generally natural streams. Water from these
Figure 4.9-1
Creeks in the Master Plan and WPF Vicinity


Sunnyvale WPCP Master Plan. 120457
tributaries is collected and routed to the Bay primarily through engineered channels in the urbanized areas of Saratoga, San Jose, and Santa Clara.

**Saratoga Creek**

Saratoga Creek flows northward through the center of the well injection area and drains the approximately 17 square mile Saratoga Creek Watershed, which stretches northward from the Santa Cruz Mountains in the south into the City of Santa Clara. Saratoga Creek is tributary to San Tomas Aquino Creek, and flows into San Tomas Aquino Creek north of El Camino Real in Santa Clara.

**San Tomas Aquino Creek**

San Tomas Aquino Creek passes through the southern section of the well injection area. Similar to other creeks in this region, tributaries to San Tomas Aquino Creek drain the Santa Cruz Mountains. The creek originates near El Sereno Peak in the Santa Cruz Mountains. Upon reaching the valley floor west of State Route 85, the creek discharge enters an engineered channel. From this point the creek flows north through either engineered open channels or underground culverts to Guadalupe Slough, along the way collecting stormwater from the network of storm drains in the urbanized valley area that covers most of the 27 square mile San Tomas Aquino watershed. There are no reservoirs along San Tomas Aquino Creek or its tributaries.

**Los Gatos Creek**

The WPF recharge basins are located approximately 0.1- to 0.5-mile from Los Gatos Creek, the nearest creek to the recharge basins. Tributaries drain into Los Gatos Creek from the Santa Cruz Mountains. Three water conservation reservoirs are located upstream of the reach adjacent to the recharge basins: Lake Elsman, Lexington Reservoir, and Vasona Reservoir. Elsman is used for water supply, and Lexington and Vasona Reservoirs are operated to provide groundwater recharge (Federal Emergency Management Agency [FEMA], 2014a). The reservoirs provide incidental flood control for the Town of Los Gatos. Generally drainage improvements in Los Gatos are not adequate to contain the 100-year flood flow (FEMA, 2014a). The creek is culverted downstream of the recharge basins, and flows into the Guadalupe River near State Route 87, north of Interstate 280. The Guadalupe River flows northward through San Jose and Santa Clara and to the San Francisco Bay through Guadalupe Slough.

### 4.9.1.5 Flooding

The Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers (USACE) conduct flood risk assessments and some flood risk management projects throughout the U.S., including in the San Francisco Bay. FEMA is responsible for responding to emergencies and natural disasters, including flooding, and has delineated Special Flood Hazard Areas to assign risk to the potentially flooded areas along the South Bay. Flood risk in a given area is shown on a Flood Insurance Rate Map (FIRM) prepared by FEMA. These maps show 100-year flood water elevation predictions and separate flood hazard zones. A 100-year flood is the flood having a one percent chance of being equaled or exceeded in any given year.
A variety of conditions have caused flooding in Santa Clara County. Intense storms can lead to flooding in smaller basins (like some of the basins near the WPCP and the WPF), while flooding in large basins is usually the result of storms of longer duration (FEMA, 2014a). Shallow overland flooding often occurs due to the small capacity of creeks in Santa Clara County (FEMA, 2014a). Santa Clara County also borders the San Francisco Bay and portions of land in the County, including the WPCP, are at risk for coastal flood hazards.

FEMA is revising and updating its FIRM panels for Santa Clara County, as part of the San Francisco Bay Area Coastal Study conducted by the California Coastal Analysis and Mapping Project (FEMA, 2015a). This study will revise and update flood and wave data included in the flood mapping.

Flood risk infrastructure planning and construction is primarily implemented by the Santa Clara Valley Water District (District) in cooperation with local city governments; however, in the coastal areas of Santa Clara County the U.S. Army Corps of Engineers (USACE) is also involved in flood risk planning. The USACE regulates local civil works projects under multiple federal laws (including the Rivers and Harbors Act of 1899, the Clean Water Act, and the Marine Protection, Research, and Sanctuaries Act of 1972 as amended).

Specific flood hazards and flood risk management infrastructure or plans generated by these agencies are discussed below.

**Master Plan**

The City of Sunnyvale relies upon the FEMA Flood Insurance Rate Maps (FIRMs) to identify areas of special flood hazard, and provisions for flood hazard reduction that apply to construction, utilities, and homes in these areas are included in the Municipal Code (Chapter 16.62, City of Sunnyvale Municipal Code, *Prevention of Flood Damage*). As shown in Figure 4.9-2 the FIRM for the WPCP area designates the WPCP site as within a Special Flood Hazard Area (FEMA Zone AE) that is within the 100-year flood zone (FEMA, 2009a; FEMA, 2014a). The WPCP is adjacent to the San Francisco Bay, in an area at risk for tidal flooding due to having large areas of low-lying terrain bordered by non-engineered pond berms, also referred to as levees, originally designed and constructed for commercial salt pond purposes rather than for flood risk management.

Currently these levees are not certified in accordance with FEMA criteria because they do not provide adequate freeboard to protect the WPCP in the event of a 100-year flood (Carollo/HDR, 2013). FEMA does not consider these berms to provide adequate flood protection, and maps the 100-year flood as if the berms were not present. According to the FIRM, the 100-year flood elevation at the main plant and oxidation ponds would be 11 feet above sea level (NAVD 88) (FEMA, 2009a).

The Santa Clara Valley Water District protects homes, businesses, and transportation networks from fluvial flooding in the Santa Clara Valley. After 1950, four significant flood events occurred in Sunnyvale as a result of storms. In order to better convey storm flows to the San Francisco Bay, the District constructed the Sunnyvale East and West Channels in the 1960s. These two channels both include closed and open conduits designed to convey a 10-percent-annual-chance flood from the storm drain system (SCVWD, 2013a).
Figure 4.9-2
FEMA Special Flood Hazard Areas
The Sunnyvale West Channel is currently leveed downstream of Mathilda Avenue. The Sunnyvale East Channel currently is leveed downstream of U.S. Highway 101 (SCVWD, 2013a). FEMA mapping and historic flooding indicate that the existing Sunnyvale East and West Channel flood risk management infrastructure does not provide adequate flood protection (SCVWD, 2013a). To protect surrounding areas from fluvial flooding, the District has initiated a project that will entail construction of floodwalls, rock slope protection, levee raising, and levee enlargement along both the Sunnyvale East and West Channels (SCVWD, 2013a). Reconstructed levees, floodwalls, and channels proposed under the District project would provide protection against fluvial flooding based on a water surface elevation (base flood level) of 12.24 feet, which would accommodate the 100-year flood elevation and up to 50 years of projected sea level rise (Carollo/HDR, 2013; SCVWD, 2013a). These improvements include increasing the height of levees adjacent to the channels, removing sediment from the channels, building floodwalls, and stabilizing streambank sections that are actively eroding (SCVWD, 2013a). Improvements along the Sunnyvale West Channel near the WPCP will include an inboard floodwall along the western side of Moffett Channel between Cargill Channel and Carl Road, and levee enlargements on either side of the West Channel between Caribbean Drive and Carl Road. An outboard floodwall along the eastern side of Moffett Channel between Carl Road and the eastern extent of Moffett Channel (at the northeast corner of the main plant) will be constructed by the District (SCVWD, 2013a). Improvements along the East Channel near the WPCP include floodwalls along the banks of the channel east of the Sunnyvale Landfill and levee enlargement or levee raising from downstream of State Road 237 to the confluence of the Sunnyvale East Channel with Guadalupe Slough (SCVWD, 2013a).

In addition to flood hazard mapping by FEMA and flood risk management infrastructure constructed by the District and local agencies, the USACE is also involved in flood studies in Santa Clara County. Coastal flooding in the South Bay is currently being studied by the USACE in the South San Francisco Bay Shoreline Study, which is a flood risk management and ecosystem restoration feasibility study for the South San Francisco Bay shoreline. Results of the study are being used by the federal government to determine whether a federal flood risk management and ecosystem restoration project is justified in the South Bay. The purposes of the Shoreline Study include:

- Reducing the risk to public health, human safety, and the environment due to tidal flooding along the South Bay shoreline in Santa Clara County
- Reducing potential economic damages due to tidal flooding in areas near the South Bay shoreline in Santa Clara County
- Restoring ecological function and habitat quantity, quality, and connectivity in the Study Area for native plant and animal species

In addition to providing information to evaluate whether a federal flood risk management project is justified in the South Bay, the Shoreline Study identified potential flood risk management actions that could be included in the federal flood risk management project, including:

- Relocating homes/businesses in flood-prone areas
- Creating a flood risk management plan
4.9 Hydrology

- Increasing channel capacity
- Constructing flood risk management levees and setback levees
- Constructing/Improving inboard former salt pond levees
- Breaching levees along tidal creeks
- Constructing flood walls; and
- Installing erosion-control measures.

The WPCP is within the economic impact areas identified for evaluation in the Shoreline Study, to be evaluated during Phase 2 of the study or later. Phase 1 improvements include flood risk management infrastructure and habitat restoration in an area northeast of the WPCP (USACE, 2014).

**Water Purification Facilities**

The well injection area and the recharge basins are outside of the 100-year flood hazard zone except where creeks cross the well injection area (FEMA, 2009b). Flood protection in the WPF vicinity is generally managed by the District. Flood protection infrastructure is present on the creeks that flow through the injection well area.

- **Calabazas Creek.** Flood improvements consisting of bridge and culvert construction are in place along Calabazas Creek in the City of Saratoga; however, these facilities are not considered adequate to protect the area from the 100-year flood (FEMA, 2014a). The 100-year flood flow is generally contained within the banks of Calabazas Creek or tributary engineered channels along the reach that flows through the injection well area (FEMA, 2009b).

- **Saratoga Creek.** FEMA has mapped Saratoga Creek channel and small zones around the channel in Saratoga, as being within the 100-year flood Special Flood Hazard Zone. The Special Flood Hazard Zone does not spread beyond the creek channel through the entire natural reach that crosses the well injection area (FEMA, 2009b).

- **San Tomas Aquino Creek.** FEMA has mapped San Tomas Aquino Creek channel and small areas adjacent to the channel near State Route 85 as occurring within the 100-year floodplain (FEMA, 2014b). Within the well injection area, some flooding could occur north of and adjacent to State Route 85 (FEMA, 2014b).

- **Los Gatos Creek.** In the vicinity of the recharge basins, the 100-year flood along Los Gatos Creek is limited to within and just outside of the Los Gatos Creek channel (FEMA, 2009b). The WPF recharge basins are not within the Special Flood Hazard Zones.

As part of its mission to manage water supply in Santa Clara County, the District maintains dams and reservoirs in the foothills south and southwest of the WPCP area. In addition to the flood risk management infrastructure identified above, the following dams capture and slow water along creeks in the vicinity of the WPF. To manage flood risk associated with dam failure, the District has mapped dam inundation areas as described below.
Lexington Reservoir. The Lexington Reservoir and Lenihan Dam are located on Los Gatos Creek, upstream of the recharge basins. The recharge basins are within the dam inundation area. The well injection area extends into the western extent of the dam inundation area (SCVWD, 1995).

Stevens Creek Dam and Reservoir. The Stevens Creek Dam and Reservoir are located on Stevens Creek, south of the WPCP and west of the WPF facilities. Portions of the groundwater replenishment facilities pipelines may be located within the Stevens Creek dam inundation area, which in the area north of Interstate 280 extends east from Foothill Expressway to South Wolfe Road (SCVWD, 1994). The WPCP, well injection area, and recharge basins are not within the Stevens Creek dam inundation area.

Vasona Dam. The recharge basins are also within the dam inundation area of Vasona Dam, located just upstream of the recharge basins in Los Gatos (SCVWD, 1973). No other Master Plan or WPF facilities are within the Vasona Dam inundation area.

4.9.1.6 Drainage

Regional Drainage

The WPCP is located adjacent to the southwestern boundary of the San Francisco Bay, a low point in the tectonically influenced sedimentary basin between the Santa Cruz Mountains to the southwest and the Diablo Range to the northeast. From sea level near the Bay’s edge the Santa Clara Valley slopes uphill very gently (approximately 1-2 percent slope) until reaching the Santa Cruz Mountains in the south at about 350 feet amsl near Cupertino. The well injection area and recharge basins are also in the Santa Clara Valley, located adjacent to the foothills of the Santa Cruz Mountains at approximately 250 feet amsl. The soils in the Santa Clara Valley are derived from alluvial deposits eroded from the surrounding mountains during the past 3 to 6 million years (FEMA, 2014a) (see Section 4.8, Geology, Soils, Seismicity and Mineral Resources for additional information about soils near the WPCP and WPF).

Drainage pathways in the area are a combination of natural channels and channels altered by human development (storm sewers, culverts) (FEMA, 2014a). Drainage patterns in the area have been altered by urbanization and the amount of surface runoff has increased (FEMA, 2014a). Historically drainage in the Sunnyvale area was also affected by local subsidence after extended groundwater withdrawal to support agriculture during the first half of the 20th century (SCVWD, 2013a). This disrupted the natural drainage pathways of the Sunnyvale area and caused local ponding and flooding. The Sunnyvale East and West Channels were constructed to provide a conduit for flood flows (SCVWD, 2013a). Ponding and flooding could occur at the main plant site and in portions of the oxidation ponds, if they are developed, given the low infiltration rates of the sediments/soils and elevation close to sea level.

Campbell, Cupertino, Los Gatos, San Jose, Santa Clara, Saratoga, Sunnyvale, the County of Santa Clara, and the Santa Clara Valley Water District are member agencies in the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). These member agencies share a common NDPES Municipal Regional Permit to discharge stormwater into South San Francisco Bay. The mission of SCVURPPP is to assist in the protection of beneficial uses of receiving waters.
by preventing pollutants generated from activities in urban service areas from entering runoff to the maximum extent practicable (SCVURPPP, 2004). SCVURPPP incorporates regulatory, monitoring, and outreach measures aimed at reducing pollution in urban runoff to the “maximum extent practicable” to improve the water quality of the South San Francisco Bay and the streams of Santa Clara Valley (SCVURPPP, 2015). The individual permittees in SCVURPPP implement most of the BMPs and control measures. Each permittee has organized its own urban runoff pollution prevention program. SCVURPPP also defines model performance standards which cities can then use to develop their local programs.

Master Plan

The City of Sunnyvale owns and operates approximately 3,200 storm drain inlets, two pump stations, and 150 miles of storm drains (City of Sunnyvale, 2011). Storm drain inlets discharge directly into the Bay. The two pump stations lift stormwater from low-lying areas to creeks and sloughs, from where gravity flow conveys the stormwater to the Bay. The Sunnyvale General Plan identifies policies and statements regarding regular maintenance of the stormwater system.

The City of Sunnyvale complies with federal National Pollutant Discharge Elimination System (NPDES) requirements through participation in the SCVURPPP. The City of Sunnyvale has passed an ordinance that provides appropriate adequate legal authority to implement provisions of the NPDES Municipal Regional Permit pursuant to the SCVURPPP program. Provision C.3 of the Municipal Regional Permit requires new development and redevelopment projects that create or replace 5,000 square feet or more of impervious surfaces to incorporate treatment measures, source control measures, and site design features to reduce the pollutant load in stormwater discharges and to manage runoff. Additionally, all projects that create between 2,500 and 10,000 square feet of impervious area must implement site design measures such as directing runoff into vegetated areas or constructing uncovered parking lots and driveways with permeable surfaces (RWQCB, 2015). Stormwater best management practices required in the Municipal Regional Permit include measures that support appropriate drainage of stormwater, such as controlling debris, street and road repair and maintenance, installing landscaping that promotes surface infiltration in new developments and redevelopments, and implementation of other low impact development practices that encourage the infiltration of stormwater.

At the WPCP, stormwater is collected by onsite is routed to the primary facilities for treatment. Coverage under the statewide permit for discharges of stormwater associated with industrial activities is not required for the WPCP, pursuant to RWQCB Order No. R2-2014-0035. As the WPCP does not discharge stormwater runoff to the Sunnyvale storm sewer system, the WPCP area is not party to the Municipal Regional Permit.

The drainage characteristics of soils or earth materials underlying the main plant and the oxidation ponds differ. Fill has been placed at the main plant site multiple times since the 1950s, and is up to ten feet thick in eastern portions of the main plant site (Fugro, 2015). The fills are underlain by organic silty clays, with thin layers of medium dense silty and clayey sands (Fugro, 2015). Sediments in the oxidation ponds are classified as hydrologic soil group C. These sediments have a slow infiltration rate when wet (NRCS, 2014). While the fills at the main plant
site are not classified by the NRCS, fills are generally engineered to limit water transmission by compressing the fill material. The depth to groundwater at the main plant is approximately 15 feet below ground surface, or about 4 feet below sea level.

**Water Purification Facilities**

Stormwater from the well injection area, potential pipelines, and the recharge basins drains to the nearby creeks and stormwater conveyance channels administered by the District. Many of the cities in Santa Clara County are participants in SCVURPPP, and thus permittees of the Municipal Regional Permit, which prohibits the discharge of non-stormwater into storm drain systems and floodplains and identifies receiving water limitations (controls on water quality). Stormwater in the well injection area, which is urbanized, drains to Calabazas, Saratoga, or San Tomas Aquino Creeks. The WPF pipelines could also cross the cities of Sunnyvale, Cupertino, Santa Clara, San Jose, and Campbell. These local jurisdictions are responsible for operation and maintenance of storm sewers in these areas. All of the cities affected by the Master Plan and the WPF are members of SCVURPPP and have either adopted the model performance standards or adapted them to their local jurisdictions, ensuring compliance with the Municipal Regional Permit (see requirements described above, and in Section 4.9.2.3, below).

The WPF pipes would be below ground, and the locations of the pipes are not currently known. The materials in these areas are alluvial deposits, with texture ranging from clays to sand and gravel. The infiltration capacity of the fill materials would depend on the texture and compaction of the fill. Between the WPCP and the well injection area and recharge basins, groundwater elevation increases from near sea level to approximately 120 feet amsl (SCVWD, 2013b), or approximately 100-200 feet below the ground surface.

The City of Cupertino and the District work together to minimize the risks of flooding (City of Cupertino, 2014). Cupertino manages stormwater drainage infrastructure within the city boundaries. The storm drain system currently operates adequately, within localized flooding limited to unimproved streets.

Santa Clara’s storm drain system consists of curb inlets that collect and channel surface water, from rainfall and other sources, into a series of pipeline beneath City roadways (City of Santa Clara, 2010). All four streams that cross through the City of Santa Clara have been substantially channelized and modified to reduce flood hazards (City of Santa Clara, 2010).

The City of Campbell operates and maintains a stormwater drainage system and coordinates with surrounding jurisdictions and Santa Clara County to provide regional storm drainage for the Santa Clara Valley area (City of Campbell, 2014). The drainage system consists of a series of inlets and pipes that channel storm runoff to various percolation ponds and Los Gatos and San Tomas Aquino creeks, which discharge into San Francisco Bay. Some of the City’s storm drain system currently discharges into several groundwater recharge facilities; however, the City is working to reroute this discharge into the creeks.
Within the valley, drainage systems are of diverse physical types, and have diverse ownership and maintenance responsibility. Drainage facilities consist of gutters, swales, ditches, culverts, storm drain inlets, catch basins, storm drain lines, pump stations, and detention basins. In most cases, these facilities are owned and maintained by the municipality in which the facility is located. The natural drainages and flood control channels, some detention basins, and groundwater recharge basins are maintained and operated by the District.

4.9.1.7 Groundwater

Regional Groundwater

The Santa Clara Valley is underlain by thick alluvial deposits, in some places as thick as 1,500 feet (Wentworth et al., 2015), deposited on top of Franciscan bedrock. The WPCP and Water Purification Facilities would be located in the Santa Clara Subbasin of the Santa Clara Valley Groundwater Basin. The surface area of the Santa Clara Subbasin is 240 square miles (DWR, 2004). The subbasin occupies a geologic trough between the Diablo Range to the east and the Santa Cruz Mountains to the west. The southern end of the groundwater subbasin is a groundwater divide near Morgan Hill (DWR, 2004).

Aquifers

While water is present throughout the thick sedimentary deposits, the effective base of the groundwater flow system ranges between 500 feet and 900 feet below the ground surface (Hanson, 2015). The groundwater flow system is generally discussed as two related systems composed of upper and lower aquifers. Eight sequences of coarse-grained to fine-grained sediments are recognized in the basin, representing the glacial climate cycles over the past 718,000 years (Wentworth et al., 2015; Hanson, 2015). The coarse-grained layers made up of fluvial sand and gravel are the aquifers through which groundwater flows, and which lie relatively flat and range in thickness from 10 to 200 feet (Hanson, 2015). The aquifers are at depths of approximately 75 feet, 150 feet, 300 feet, 425 feet, 700 feet, 850 feet, and 975 feet below ground surface, although the depths range from one location to another throughout the basin (Wentworth et al., 2015). The principal aquifer in the basin includes all water-bearing sediments deeper than 150 feet below ground surface (SCVWD, 2013b).

Groundwater Flow, Recharge, Pumping and Subsidence

Groundwater generally converges while flowing from the surrounding hills to the center of the Santa Clara Valley, and then flows north toward the San Francisco Bay (Hanson, 2015); however, pumping throughout the valley results in localized redirection of the general flow path. In addition to the groundwater flow controls exerted by the basin lithology and pumping, multiple faults in the area may also act as hydrologic flow barriers by juxtaposing rocks of differing lithologies (Hanson, 2015). Depth-to-groundwater decreases toward the interior of the Santa Clara Subbasin, and rises above the land surface in flowing artesian wells close to the Bay (SCVWD, 2013b).

Artificial recharge represents about half of the inflow of water into the Santa Clara Valley (Hanson, 2015). Imported water and local runoff are infiltrated through 400 acres of ponds and
by direct release into selected streams (Hanson, 2015). Artificial recharge is being stored in the aquifers and moving through the upper 500 feet of the groundwater flow system (Hanson, 2015). When wells are pumped less, due to less groundwater demand, the artificial recharge has been shown to infiltrate into the lower aquifers (Hanson, 2015).

Ongoing management monitoring by the District indicates that seawater intrusion is not occurring in the Santa Clara Subbasin, as the pressure of groundwater at the Bay’s edge is sufficient to keep Bay water from intruding via natural transmission pathways. The District manages groundwater recharge to help maintain adequate pressure in the aquifers such that groundwater flows to the San Francisco Bay and saline water does not intrude into the groundwater system (SCVWD, 2013b).

Groundwater pumped in the Santa Clara Valley is generally extracted from the coarse-grained aquifers. The finer-grained fluvial silt and clay layers act as aquitards. When excessive pumping causes water to be released from clay aquitards, compaction may result, contributing to land subsidence (Hanson, 2015). Subsidence is the gradual or sudden lowering of the land surface, often due to withdrawal of subsurface fluids such as groundwater or oil, and can be elastic (recoverable) or inelastic. Since 1970, measured subsidence has been within the elastic range, reflecting seasonal elevation changes caused by pumping. The District measures groundwater elevation in 219 wells monthly, and reports 106 of these elevations quarterly to California Statewide Groundwater Elevation Monitoring. The District has established a threshold tolerable subsidence rate of 0.01 feet/year on average. The District evaluates the average land subsidence by collecting data hourly from compaction records at two extensometers2 and averaging the amount of subsidence observed over an 11-year period. The average for the 11-year period from 2003-2013 was 0.003 feet/year, below the tolerance thresholds (SCVWD, 2013b).

**Master Plan**

Based on previous investigations, the groundwater level in the vicinity of the oxidation ponds ranged from -4 to 3 feet amsl (NAVD 88). During a geotechnical investigation prepared for the Primary Treatment Facility project, groundwater was encountered between -6 and -2 feet amsl in the western portion of the main plant site. In the eastern portion of the main plant site, the groundwater level is about -4 feet amsl (Fugro, 2015).

**Water Purification Facilities**

The WPF recharge basins and injection wells would be located in the Santa Clara Plain Recharge Area, the area in the uplands of the Santa Clara Valley where surface water can infiltrate into the Valley’s aquifers (SCVWD, 2013b). The WPF and the main plant are located in the North County groundwater recharge zone (SCVWD, 2013b). In 2013, 95,200 acre-feet of groundwater was pumped from the North County zone, representing approximately 60 percent of total groundwater pumped in 2013 (SCVWD, 2013b). About 96,500 acre-feet of local and imported water were recharged through District facilities (recharge basins and in-stream releases from

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2 An extensometer measures the one-dimensional change in thickness of a specified depth interval. Extensometers are commonly used to measure the compaction and expansion of aquifer systems.
4.9.2 Regulatory Setting

The Master Plan and WPF fall under the jurisdiction of multiple local, state, and federal agencies with respect to specific aspects of planning, construction, restoration, and management. A summary of key laws, regulations and policies is presented below but it should not be considered to be a complete list of all potentially applicable regulations.

4.9.2.1 Federal Statutes, Regulations, and Executive Orders

**Federal Clean Water Act**

As described in Section 4.7.2.1, discharges of pollutants to waters of the United States are regulated pursuant to the federal Clean Water Act. In addition to the water quality protections described in Section 4.7.2.1, the following provisions of the Clean Water Act are relevant to this project:

- Sections 303 and 304, which provide water quality standards, criteria, and guidelines.

- Section 401, which requires every applicant for a federal permit or license for any activity that may result in a discharge to a water body to obtain a water quality certification that the proposed activity would comply with applicable water quality standards (in California, the certification is issued by the SWRCB and RWQCBs).

- Section 402, which regulates point- and nonpoint-source discharges to surface waters (other than dredge or fill material) through the NPDES program. In California, the SWRCB oversees the NPDES program, which is administered by the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits.

- Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including some wetlands. Activities in waters of the United States that are regulated under this program include fills for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry. A Section 401 certification is required for all Section 404 permitted activities.

**Clean Water Act Section 303(d) Impaired Waters List**

Under Section 303(d) of the CWA, states are required to develop lists of water bodies that would not attain water quality objectives after implementation of required levels of treatment by point-source dischargers (municipalities and industries). Section 303(d) requires that the state develop a Total Maximum Daily Load (TMDL; also called the pollution control plan) for each of the listed pollutants. The TMDL is the amount of loading that the water body can receive and still be in compliance with water quality objectives. The TMDL can also act as a plan to reduce loading of a specific pollutant from various sources to achieve compliance with water quality objectives. The TMDL prepared by the state or the U.S. EPA must include an allocation of allowable loadings to point and nonpoint sources, with consideration of background loadings and a margin of safety.
The TMDL must also include an analysis that shows the linkage between loading reductions and the attainment of water quality objectives. EPA must either approve a TMDL prepared by the state or, if it disapproves the state’s TMDL, issue its own. NPDES permit limits for listed pollutants must be consistent with the waste load allocation prescribed in the TMDL. After implementation of the TMDL, it is anticipated that the problems that led to placement of a given water body on the Section 303(d) list would be remediated. In California, preparation and management of the Section 303(d) list is administered by the RWQCBs. Table 4.9-2 provides an overview of the segments within the planning area that are included on the current 303(d) list.

### TABLE 4.9-2

**LIST OF 303(d) WATER QUALITY IMPAIRMENTS FOR CREEK SEGMENTS IN THE VICINITY OF THE WPCP AND WFP SITES**

<table>
<thead>
<tr>
<th>Water Body</th>
<th>Nearest Master Plan Component</th>
<th>Pollutant</th>
<th>Potential Source</th>
<th>TMDL Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Trash</td>
<td>Illegal Dumping, Urban Runoff/Storm Sewers</td>
<td>Est. TMDL Completion: 2021</td>
</tr>
<tr>
<td>Calabazas Creek</td>
<td>WPF – Injection Well Area</td>
<td>Diazinon</td>
<td>Urban Runoff/Storm Sewers</td>
<td>U.S. EPA Approved TMDL: 2007</td>
</tr>
<tr>
<td>San Tomas Aquino Creek</td>
<td>WPF – Pipelines, Injection Well Area</td>
<td>Trash</td>
<td>Illegal Dumping, Urban Runoff/Storm Sewers</td>
<td>Est. TMDL Completion: 2021</td>
</tr>
<tr>
<td>Los Gatos Creek</td>
<td>WPF – Pipelines, Recharge Basins</td>
<td>Diazinon</td>
<td>Urban Runoff/Storm Sewers</td>
<td>U.S. EPA Approved TMDL: 2007</td>
</tr>
<tr>
<td>San Francisco Bay, South</td>
<td>Sunnyvale WPCP</td>
<td>Chlordane</td>
<td>Nonpoint Source</td>
<td>Est. TMDL Completion: 2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DDT</td>
<td>Nonpoint Source</td>
<td>Est. TMDL Completion: 2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dieldrin</td>
<td>Nonpoint Source</td>
<td>Est. TMDL Completion: 2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dioxins</td>
<td>Atmospheric Deposition</td>
<td>Est. TMDL Completion: 2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Furan Compounds</td>
<td>Atmospheric Deposition</td>
<td>Est. TMDL Completion: 2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Invasive Species</td>
<td>Ballast Waters</td>
<td>U.S. EPA TMDL Approval: 2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mercury</td>
<td>Varied Sources</td>
<td>U.S. EPA TMDL Approved: 2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PCBs</td>
<td>Unknown Nonpoint Source</td>
<td>U.S. EPA TMDL Approved: 2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Selenium</td>
<td>Domestic Use of Groundwater</td>
<td>Est. TMDL Completion: 2019</td>
</tr>
</tbody>
</table>

NOTES: TMDL = Total Maximum Daily Load


### National Flood Insurance Acts

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 were enacted to reduce the need for flood protection structures and to limit disaster relief costs by restricting development on floodplains. FEMA was created in 1979 to administer the National
Flood Insurance Program and to develop standards for fluvial and coastal floodplain delineation. As part of the National Flood Insurance Program, FEMA publishes Flood Insurance Rate Maps that identify flood hazard zones within a community.

**Coastal Zone Management Act**

The Coastal Zone Management Act of 1972 requires that federal actions be consistent with state coastal plans. The San Francisco Bay Conservation and Development Commission (BCDC) San Francisco Bay Plan is approved under the Coastal Zone Management Act. To implement this provision, federal agencies make “consistency determinations” on their proposed activities and applicants for federal permits, licenses, other authorization or federal financial assistance make “consistency certifications.” BCDC then has the opportunity to review the consistency determinations and certifications and to either concur with them or object to them. The Bay Plan is discussed in more detail in Section 4.9.2.2, State Regulations, below.

**Executive Order 11988-Floodplain Management**

Executive Order 11988 of 1977 requires federal agencies to recognize the values of floodplains and to consider the public benefits from restoring and preserving floodplains. Under this order USACE is required to take action and provide leadership to:

- Avoid development in the base floodplain;
- Reduce the risk and hazard associated with floods;
- Minimize the impact of floods on human health, welfare, and safety; and
- Restore and preserve the beneficial and natural values of the base floodplain.

**4.9.2.2 State Regulations**

**San Francisco Bay Conservation and Development Commission Bay Plan**

The San Francisco Bay Plan (Bay Plan) contains the policies that BCDC uses to determine whether permit applications can be approved for projects within the BCDC jurisdiction, which consists of the Bay, salt ponds, managed wetlands, certain waterways and land within 100 feet of the Bay (see Section 4.7.2.2 for additional details about BCDC jurisdiction).

In October 2011, BCDC amended its San Francisco Bay Plan to update the 22-year-old sea level rise findings and policies in the plan and to add a new section dealing more broadly with climate change and adapting to sea level rise. The Bay Plan generally discourages building in shoreline areas that are susceptible to future flooding, but encourages development in suitable low-lying areas provided that flood risks are addressed. The plan encourages habitat preservation and enhancement in suitable areas (San Francisco Bay Conservation and Development Commission, 2011).

**California Water Code**

The California Water Code ensures that the water resources of the state are put to beneficial use and that the conservation of water is exercised in the interest of the people and for public welfare. All
projects in California must abide by Division 5 of the State of California Water Code, which sets the provisions for flood control. The Code includes a number of provisions that pertain to local and state flood management, and flood protection. Section 8100 et seq. of the Code contains guidelines for the construction of public works and improvements including the protection and restoration of watersheds, levees or check dams to prevent overflow or flooding, conservation of the floodwaters, and the effects of construction projects on adjacent counties (especially upstream and downstream along a river). Section 12840 et seq. of the Code contains provisions related to flood prevention projects.

**Porter-Cologne Act**

As described in greater detail in Section 4.7.2.2, the State of California’s Porter-Cologne Water Quality Control Act provides the basis for water quality regulation within California and assigns primary responsibility for the protection and enhancement of water quality to the State Water Resources Control Board and the nine RWQCBs. Under the Porter-Cologne, the State Water Resources Control Board and RWQCBs also have the responsibility of granting NPDES permits and Waste Discharge Requirements (WDRs) for certain point-source and non-point discharges to waters. The Porter-Cologne Act also allows the California SWRCB to adopt statewide Water Quality Control Plans or Basin Plans, which serve as the legal, technical, and programmatic basis of water quality regulation for a region. These regulations limit impacts on water quality from a variety of urban sources.

**State Water Resources Control Board**

Created by the California State Legislature in 1967, the State Water Resources Control Board holds authority over water resources allocation and water quality protection within the State. The five-member SWRCB allocates water rights, adjudicates water rights disputes, develops statewide water protection plans, establishes water quality standards, and guides the nine Regional Water Quality Control Boards (RWQCBs). The mission of the SWRCB is to, “preserve, enhance, and restore the quality of California’s water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations.”

**San Francisco Bay Regional Water Quality Control Board and Basin Plan**

The Water Quality Control Plan for the San Francisco Bay Basin of California (or Basin Plan) establishes water quality objectives and beneficial uses for waters in the San Francisco Bay basin. This document is the RWQCB’s master water quality control planning document. It designates beneficial uses and water quality objectives for “waters of the State,” including surface waters and groundwater, and includes implementation programs to achieve the water quality objectives. The Basin Plan has been adopted by the RWQCB and approved by the SWRCB, EPA, and the Office of Administrative Law. Table 4.10-6 in Section 4.10, Water Quality, indicates the beneficial uses identified in the Basin Plan for water bodies relevant to the project.
Pursuant to the California Water Code\(^3\), the RWQCB regulates discharges of pollutants to the navigable waters of the United States and of waste that could affect the quality of waters of the state, including discharges of solid waste to land (such as in landfills), through the issuance of NPDES permits and waste discharge requirements (WDRs), respectively. The individual NPDES permit regulating the discharge of treated water from the WPCP is described, and any changes to water quality at that point of discharge are evaluated, in Section 4.10, Water Quality.

**Sunnyvale Landfill Waste Discharge Requirements**

The RWQCB first adopted WDRs for the Sunnyvale Landfill in 1978, while the landfill was still operational. Since closure of the landfill the WDRs have been updated, mostly recently in 2004 (Order No. R2-2004-0030; RWQCB, 2004). The 2004 updated landfill WDRs currently govern the maintenance of the closed landfill, including activities such as relocation of wastes, control of landfill leachate and landfill gas, excavation in the landfill area, protection of surface water and groundwater quality, and operation of the landfill cap and groundwater monitoring systems. In accordance with these WDRs, a corrective action program based on hydraulic capture of groundwater by sanitary sewer and storm drain pipelines and channels continues to be in effect. The City is required to maintain all devices or designed features installed in accordance with the WDRs (such as leachate and landfill gas collection and control systems) such that they continue to operate as intended without interruption, and must promptly correct any failure that threatens the containment of the landfill once the method and schedule of correction is approved by the RWQCB (RWQCB, 2004). Any changes to the landfill site proposed must be characterized in a technical report that specifies components of the design necessary to maintain the integrity of the landfill cap and prevent water quality impacts, and no material changes may be made to the site without approval by the RWQCB (RWQCB, 2004). The WDRs also require that the City maintain adequate trained staff and funding to operate and maintain the landfill treatment and control facilities (RWQCB, 2004).

**NPDES General Permit for Discharges of Stormwater Associated with Construction Activities**

Construction activities disturbing one acre or more of land, or that disturb less than one acre but are part of a larger common plan of development of one or more acres, are subject to the permitting requirements of the NPDES General Construction Activity Permit for Discharges of Storm Water Runoff Associated with Construction and Land Disturbing Activities (Construction General Permit). The Construction General Permit requires the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which must be developed for the specific project type, location, and characteristics, and must be submitted to the SWRCB along with the permit application (a Notice of Intent) before construction begins. A SWPPP is designed to ensure that 1) all pollutants and their sources are controlled; 2) all non-stormwater discharges are identified and either eliminated, controlled, or treated; 3) site best management practices result in the reduction or elimination of pollutants in stormwater and authorized non-stormwater discharges; 4) calculations, design details, and BMP controls are correct; and 5) post-construction

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\(^3\) California Water Code Sections 13370-13389 and 13263, respectively.
stabilization BMPs are completed. Implementation of the SWPPP starts with the commencement of construction and continues through the completion of the project. Upon completion of the project, which includes stabilization of all disturbed soils, the applicant must submit a Notice of Termination to the SWRCB notifying the agency that construction is completed. Under the permit, monitoring, reporting, and training requirements for management of stormwater pollutants are also required. The disturbance to areas associated with construction of structures and facilities for the project would require coverage under a General Construction Permit.

California Climate Adaptation Strategy

The 2009 California Climate Adaptation Strategy, is a multi-sector strategy designed to help guide California’s efforts in adapting to climate change impacts. It was developed pursuant to November 2008 Executive Order (S-13-08) by the Governor with input from multiple state agencies. The purpose of the 2009 Strategy is to identify the best known science on climate change impacts in seven specific sectors and make recommendations on how to manage those effects (California Natural Resources Agency, 2009). The 2009 publication is designated as the first iteration of the State’s adaptation strategy.

The seven sectors included in the report are: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. The contents of the strategy were developed to address how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. A key recommendation in the Strategy is that State agencies should generally not plan, develop, or build any new significant structure in a place where that structure will require significant protection from sea level rise, storm surges, or coastal erosion during the expected life of the structure. However, the Strategy recognizes that vulnerable shoreline areas containing existing development that have regionally significant economic, cultural, or social value may have to be protected, and infill development in these areas may be accommodated.

Resolution of the California Ocean Protection Council on Sea Level Rise

In March 2011, the California Ocean Protection Council published a resolution recommending that state agencies incorporate the risks posed by sea level rise into project and program plans (California Ocean Protection Council, 2011). The resolution was targeted towards state agencies and nonstate entities implementing projects or programs funded by the state or on state property (California Ocean Protection Council, 2011). The sea level rise projections were developed by the Coastal and Ocean Working Group of the California Climate Action Team and reported in the Sea Level Rise Interim Guidance Document (CO-CAT, 2010).

National Academy of Science Sea Level Rise Assessment Report

For California, sea level rise projections developed by the state are being confirmed by a National Academy of Science study. The final National Academy of Science Sea Level Rise Assessment Report, due at the end of 2012, will advise how California should plan for future sea level rise. The report will include local sea level rise projections specific to California, taking into account
issues such as coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates, and the range of uncertainty in selected sea level rise projections.

4.9.2.3 Local Policies

**Santa Clara Valley Water District Act**

The Santa Clara Valley Water District operates as the flood control agency for Santa Clara County. Their stewardship also includes creek restoration, pollution prevention efforts, and groundwater recharge. The Santa Clara Valley Water District Act of 1951 established the District, giving it the authority to implement the following District purposes identified by the Act.

- Protect Santa Clara County from flood and stormwater.
- Provide comprehensive conservation and management of flood, storm and recycled waters for all beneficial uses.
- Increase and prevent the waste of the water supply in the District.
- Enhance, protect, and restore stream, riparian corridors, and natural resources in connection with other purposes of water supply and flood protection.

Under the Water Resources Protection Ordinance (Ordinance 06-1), the District requires encroachment permits for modifications on District facilities and/or District easements. Activities requiring a permit include: grading, removing, dredging, mining, or extraction of any materials; constructions, reconstruction, demolition or alteration of the size of any structure, including any facility of any private, public or municipal utility; and the removal or installation of vegetation. Permits, if granted, may require mitigation for any disturbance to the health of the watercourse.

The District, along with 15 cities, the county and business, agriculture, streamside property owner and environmental interests set up the Water Resources Protection Collaborative, which has prepared and adopted Guidelines and Standards for Land Use Near Streams: A Manual of Tools, Standards, and Procedures to Protect Streams and Streamside Resource in Santa Clara County.

**Municipal Regional Stormwater NPDES Permit**

The EPA has delegated oversight of NPDES requirements for municipal urban runoff discharges in California to the State Water Resources Control Board and the nine RWQCB offices. The San Francisco Bay RWQCB regulates water quality in the Bay Area in accordance with the Water Quality Control Plan or “Basin Plan.” The Basin Plan lists the beneficial uses which the RWQCB has identified for local aquifers, streams, marshes, rivers, and the Bay, as well as the water quality objectives, and criteria that must be met to protect these uses. The RWQCB implements the Basin Plan by issuing and enforcing waste discharge requirements to control water quality and protect beneficial uses.

To control pollution from urban runoff, in 2009 the RWQCB issued one Municipal Regional Stormwater NPDES Permit (MRP; NPDES Permit Order R2-2015-0049, NPDES Permit No. CAS612008, as revised) to regulate stormwater discharges from municipalities and local agencies in Alameda, Contra Costa, San Mateo, and Santa Clara counties, and the cities of
Fairfield, Suisun City, and Vallejo. The MRP requires that permittees prohibit the discharge of non-stormwater (materials other than stormwater) into storm drain systems and watercourses. Stormwater discharges are also required to not adversely affect state waters or contribute to a violation of water quality standards for receiving waters (such as the San Francisco Bay). Some provisions require regional action and collaboration, but others relate to specific municipal activities over which the municipalities have individual responsibility and control. The NPDES program requires that all permits be renewed every five years, including the MRP. Currently the MRP is undergoing review by the RWQCB. The MRP includes provisions applicable to new development and redevelopment, which require permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects.

Hydromodification Management Plan

In addition to water quality controls, the MRP has hydromodification controls as defined in the Hydromodification Management Plan. The MRP requires all new and redevelopment projects that create or replace one acre or more of impervious surface to manage development-related increases in peak runoff flow, volume, and duration, where such hydromodification is likely to cause increased erosion, silt pollutant generation or other impacts to beneficial uses of local rivers, streams, and creeks. Projects may be deemed exempt from the permit requirements if they do not meet the size threshold, drain into tidally influenced areas or directly into the Bay, drain into hardened channels, or are projects in subwatersheds that are 70 percent or more impervious based on the Hydromodification Management Applicability Map (as revised in November 2010).

The WPCP site falls entirely within baylands or catchments draining to hardened channels and/or tidal areas, which makes this project exempt from the requirements in the Hydromodification Management Plan.

Portions of the well injection area and recharge basins fall within subwatersheds that are less than 70 percent impervious (that is, less than 70 percent of the area in these drainages is paved or built upon with impervious surface). The WPF would not pave or otherwise alter the recharge basins; however, well pads would be installed for the injection wells. If the combined area of the well pads is greater than one acre, well pad construction would require management of development-related increases in peak runoff flow under the Hydromodification Management Plan.

4 Hydromodification is a change in stormwater runoff characteristics from a watershed caused by changes in land use conditions (i.e., urbanization) that alter the natural cycling of water. Changes in local land use can cause runoff volumes and velocity to increase which can result in a decrease in natural vegetation, changing of river/creek bank grades, soil compaction, and the creation of new drainages.
Santa Clara Valley Urban Runoff Pollution Prevention Program

The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) is an association of fifteen agencies in Santa Clara Valley that share a common permit to discharge stormwater to South San Francisco Bay. Member agencies include Campbell, Cupertino, Los Gatos, San Jose, Saratoga, Sunnyvale, and the Santa Clara Valley Water District (SCVURPPP, 2015). The mission of SCVURPPP is to assist in the protection of beneficial uses of receiving waters by preventing pollutants generated from activities in urban service areas from entering runoff to the maximum extent practicable (SCVURPPP, 2004). Member agencies protect receiving waters through compliance with federal NPDES requirements described in the Municipal Regional Stormwater Permit (NPDES Permit Order R2-2015-0049, NPDES Permit No. CA612008), discussed above. Projects that create or replace 10,000 square feet or more of new or replaced impervious surface (or 5,000 square feet for certain types of projects) must have a Stormwater Management Plan, which identifies appropriate best management practices (BMPs) to implement with the project in order to limit the project’s impact on stormwater drainage and water quality. The individual permittees in SCVURPPP implement most of the MRP BMPs and control measures. Each co-permittee has organized its own urban runoff pollution prevention program. SCVURPPP also defines model performance standards (accepted by the RWQCB) which cities can then use to develop their local programs.

Santa Clara Valley Water District Well Ordinance 90-1

Well Ordinance 90-1 regulates the construction and destruction of wells in Santa Clara County. Standards of well construction are described in this ordinance.

Sunnyvale Municipal Code

Stormwater discharges regulated under the Construction General Permit (described in Section 4.9.2.2, above) are exempt from discharge prohibitions of the Sunnyvale Municipal Code Section 12.60.070, provided compliance with permit conditions is maintained to the satisfaction of the RWQCB. The City of Sunnyvale requires any person subject to an industrial or construction activity general NPDES stormwater discharge permit to comply with all provisions of the permit, and proof of compliance may be requested by the City enforcement official prior to approving a site plan, building permit, or other required building review. However, any stormwater discharges in Sunnyvale not covered by the construction general permit would be required to comply with Chapter 12.60, Stormwater Management, of the Sunnyvale Municipal Code. Chapter 12.60 and the accompanying Sunnyvale Best Management Practice Guidance Manual set forth guidance, design standards and best management practices for stormwater treatment measures, which must be utilized by developers and property owners to comply with the municipal code requirements. Chapter 12.60 includes requirements that the best management practices not lead to flooding and that a stormwater management plan be prepared and at a minimum include a description of activities and pollutant sources, descriptions of the stormwater management systems to be installed for the project, description of the operation and maintenance procedures (including inspections), and description of the record-keeping methods to ensure documentation and verification of applicable operational maintenance procedures.
Chapter 16.62 of the Sunnyvale Municipal Code contains floodplain management regulations, which apply to all areas of special flood hazards within the jurisdiction of the City of Sunnyvale. The City of Sunnyvale relies on the FEMA FIRMs to identify areas of special flood hazard. The flood hazard regulations apply to construction, utilities, and homes in special flood hazard areas.

**Sunnyvale General Plan**

Table 4.9-3 identifies General Plan policies pertaining to hydrology in the City of Sunnyvale.

<table>
<thead>
<tr>
<th>Relevant Goals, Policies and Actions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy SN-1.2</td>
<td>Take measures to protect life and property from the effects of a 1 percent (100 year) flood.</td>
</tr>
<tr>
<td>Policy SN-1.3</td>
<td>Operate and maintain the storm drainage system at a level to minimize damages and ensure public safety.</td>
</tr>
<tr>
<td>Policy SN-1.4</td>
<td>Monitor and plan for hydraulic changes due to global warming, earthquakes, and/or subsidence.</td>
</tr>
<tr>
<td>Statement SN-1.4b</td>
<td>When designing structures along shorelines, consider future sea level changes.</td>
</tr>
<tr>
<td>Goal EM-8</td>
<td>Assure the reasonable protection of beneficial uses of creeks and San Francisco Bay, established in the Regional Board’s Basin Plan, and protect environmentally sensitive areas.</td>
</tr>
<tr>
<td>Goal EM-9</td>
<td>Maintain storm drain system to prevent flooding.</td>
</tr>
<tr>
<td>Goal EM-10</td>
<td>Minimize the quantity of runoff and discharge of pollutants to the maximum extent practicable by integrating surface runoff controls into new development and redevelopment land use decisions.</td>
</tr>
<tr>
<td>Policy EM-8.3</td>
<td>Ensure that stormwater control measures and best management practices (BMPs) are implemented to reduce the discharge of pollutants in stormwater to the maximum extent practicable.</td>
</tr>
<tr>
<td>Policy EM-8.4</td>
<td>Effectively prohibit illicit discharges and improper disposal of wastes into the storm drain system.</td>
</tr>
<tr>
<td>Policy EM-8.5</td>
<td>Prevent accelerated soil erosion. Continue implementation of a construction site inspection and control program to prevent discharges of sediment from erosion and discharges of other pollutants from new and redevelopment projects.</td>
</tr>
<tr>
<td>Policy EM-9.1</td>
<td>Maintain and operate the storm drain system so that storm waters are drained from 95 percent of the streets within one hour after a storm stops.</td>
</tr>
<tr>
<td>Policy EM-9.2</td>
<td>Respond to storm drain emergencies.</td>
</tr>
<tr>
<td>Policy EM-10.1</td>
<td>Consider the impacts of surface runoff as part of land use and development decisions and implement BMPs to minimize the total volume and rate of runoff of water quality and quantity (hydromodification) of surface runoff as part of land use and development decisions.</td>
</tr>
<tr>
<td>Policy EM-10.2</td>
<td>Consider the ability of a land parcel to detain excess stormwater runoff in flood prone areas and require incorporation of appropriate controls. Require the incorporation of appropriate stormwater treatment and control measures for new and redevelopment regulated projects and/or any sites that may reasonably be considered to cause or contribute to the pollution of stormwater and urban runoff as defined in the current version of the stormwater municipal regional permit.</td>
</tr>
<tr>
<td>Policy EM-10.3</td>
<td>Require the incorporation of appropriate stormwater treatment and control measures for industrial and commercial facilities as identified in the stormwater municipal regional permit.</td>
</tr>
</tbody>
</table>
California Government Code Section 53091 and Compliance with Local Ordinances

California Government Code section 53091(d) specifies that “Building ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency.” Consequently, many of the facilities included in the WPF (which would be maintained by the District) are exempt from certain local ordinances. However, the District normally complies with noise restrictions of the jurisdiction within which a project is proposed. The District is also subject to the MRP and a member of the SCVURPPP, indicating that it must comply with stormwater discharge requirements in the MRP.

4.9.3 Impacts and Mitigation Measures

4.9.3.1 Thresholds of Significance

For the purposes of this EIR, a hydrology impact is considered significant if implementation of the proposed project would:

- Violate any water quality standards or waste discharge requirements, or otherwise degrade water quality
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off the site;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off the site;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map;
- Place structures that would impede or redirect flood flows within a 100-year flood hazard area;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table; or
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.
4.9.3.2 Approach to Analysis

This impact discussion assesses potential impacts on hydrology and water quality based on the potential for the Master Plan or WPF to result in physical hydrologic or hydrogeologic changes during construction or operation, using existing site conditions as a baseline for comparison. As the main plant area is greater than one acre, it is assumed that the entire area is disturbed at once in order to conduct a conservative analysis. Water quality impacts evaluated within this chapter are limited to stormwater quality. Potential water quality impacts associated with the discharge of treated effluent from the WPCP are discussed in Section 4.10, Water Quality. Decommissioning of the oxidation ponds is included in the Master Plan. After decommissioning, the oxidation ponds may be restored to wetlands. Restoration could involve breaching of the levees surrounding the oxidation ponds. This analysis conservatively assumes that levee breaching would be included in restoration.

For the reasons described below, there would be no impacts related to the following criteria:

**Threshold of Significance:** Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map.

The project does not propose the construction of housing; therefore, no direct impacts related to this criterion would occur.

**Threshold of Significance:** Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

There is a low risk of inundation by seiche or tsunami at the WPCP (CalEMA, 2009), and the WPCP is not located adjacent to steep slopes which could result in mudflow hazards. Proposed WPF facilities are located inland and at a distance from steep slopes. Therefore, the Master Plan or the WPF would not expose people or structures to inundation by seiche or tsunami, and this criterion is not discussed further.

4.9.3.3 Impact Summary

Table 4.9-4 lists the project’s hydrology impacts and significance determinations.

<table>
<thead>
<tr>
<th>Impact or Topic</th>
<th>HYD-1: Stormwater could degrade water quality</th>
<th>HYD-2: Alteration of existing drainage patterns resulting in erosion, sedimentation, or flooding</th>
<th>HYD-3: Risk of loss, injury, or death involving flooding, or placement of structures within 100-year floodplain</th>
<th>HYD-4: Temporary lowering of the local groundwater table</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPCP Improvements</td>
<td>LS</td>
<td>LSM</td>
<td>LSM</td>
<td>LS</td>
</tr>
<tr>
<td>Water Purification Facilities</td>
<td>LSM</td>
<td>LSM</td>
<td>LSM</td>
<td>LS</td>
</tr>
</tbody>
</table>

LS = Less than Significant impact, no mitigation required  
LSM = Less than Significant impact with Mitigation
4.9.3.4 Master Plan Impacts and Mitigation Measures

Impact HYD-1: Stormwater runoff from project construction and operation could degrade water quality, a less-than-significant impact.

Construction

Main Plant Site. Implementation of the Master Plan at the main plant would involve construction of an array of facilities and structures in support of proposed WPCP improvements. Construction activities would be expected to include the use of heavy equipment, such as bulldozers, graders, backhoes, earth movers, heavy trucks, cranes, trenchers, and other machinery. The use of heavy equipment for grading, excavation, and stockpiling soils would loosen surface sediments. Further, potential pollutants associated with the use of construction equipment, such as fuels, oil, and lubricants could be accidentally released. All waters encountered or used within the main plant site during construction (including construction dewatering, stormwater, and water used as part of dust control) would be collected and managed using Best Management Practices (BMPs) to reduce sediment prior to release to the WPCP storm drainage system, which is routed to the preliminary treatment facility and subsequently discharged in accordance with the WPCP’s individual NPDES permit (Order R2-2014-0035, NPDES Permit No. CA0037621), which has discharge limits for listed pollutants and constituents. Adherence to these requirements would ensure that receiving waters and associated beneficial uses would be protected against water quality degradation that could otherwise result from construction activities. Therefore, stormwater runoff generated during project construction activities within the main plant site would not require coverage under the Construction General Permit. Impacts on water quality, water quality standards, or waste discharge requirements related to short-term construction activities at the main plant site would be less than significant.

Outside of the Main Plant. During construction, stormwater runoff from improvements outside of the main plant would not drain to the WPCP preliminary treatment facility; instead, runoff would drain to Sunnyvale West Channel, Cargill Channel, or Moffett Channel. During storm events, pollutants, including sediment, could be entrained in stormwater runoff and released into these nearby drainage systems and eventually into the San Francisco Bay. Degradation of water quality in these waterways could in turn affect beneficial use, and could result in exceedance of San Francisco RWQCB water quality standards.

As the construction of the Master Plan improvements would be considered part of a common plan of development, all activities outside of the main plant regardless of size would be required to obtain coverage for construction stormwater discharges under the Construction General Permit and provide evidence of compliance to the City of Sunnyvale. Adherence to the Construction General Permit would require preparation of a SWPPP outlining construction BMPs related to housekeeping (storage of construction materials, waste management, vehicle storage and maintenance, pollutant control); non-stormwater management; erosion and sediment control; and run-on run-off control. For a discussion of the specific requirements of the Construction General Permit, refer to the discussion of NPDES permitting in Section 4.9.2, above. These construction activities would also be required to comply with Chapter 12.60, Stormwater...
Management, of the Sunnyvale Municipal Code. Construction of the diurnal equalization tanks, emergency storage basins, pipeline, road widening and levee raising would also be required to comply with limitations on discharges of water quality pollutants set by permits received from other regulatory agencies such as the California Department of Fish and Wildlife, BCDC, and the Army Corps of Engineers. Implementation of the SWPPP as well as adherence to other permit conditions would ensure that sediment or other pollutant emissions from the Master Plan area during construction would be reduced, to the extent required to protect beneficial use and adhere to basin plan requirements and would reduce the potential impact related to the discharge of potential water quality pollutants associated with construction activities to a less-than-significant level.

**WPCP Operations**

**Main Plant Site.** Stormwater runoff from industrial facilities associated with the existing and proposed main plant site could include a variety of water quality pollutants associated with existing or proposed operations. For example, accidental releases of fluids from sludge or biosolids storage or dewatering areas, or from other proposed facilities, could become entrained in stormwater. Additionally, chemicals used in association with the wastewater treatment process could be accidentally released. However, stormwater from the site is routed to the preliminary treatment facility, treated, and released in compliance with the WPCP’s individual NPDES permit. Implementation of the Master Plan would also include upgrade of stormwater facilities onsite to maintain stormwater control onsite. Additionally, the potential for hazardous materials releases would be minimized by adherence to an updated Hazardous Materials Business Plan, which would be required under state law, and which would be updated to include proposed Master Plan facilities. For additional discussion of the minimization of releases of potential hazardous chemicals into the environment, refer to Section 4.11, Hazards and Hazardous Materials.

**Outside of the Main Plant Site.** Stormwater runoff or accidental releases from the proposed diurnal equalization tanks, pump station, and emergency storage basins could degrade water quality, if not appropriately designed. These facilities are proposed within the oxidation ponds, and would include appropriate facilities to route stormwater to the WPCP; as such, their operation is not anticipated to adversely affect stormwater quality. While the area filled to create the diurnal equalization and emergency storage basins would be approximately 35 acres, the area created would be used for stormwater and/or wastewater detention and would drain to the primary facility via a pump and pipe, where the water would be treated prior to release into Moffett Channel at rates covered by the WPCP NPDES permit. Due to the location of the WPCP in the baylands, any part of the diurnal equalization area that would not drain to the WPCP would drain either to tidally influenced channels (Moffett Channel) or the oxidation ponds, and would not substantially affect in erosion potential of these receiving waters.

The area of the roadway improvements associated with relocated Bay Trail access is not currently known, however, if the proposed parking area repaves an area greater than 5,000 square feet, the City of Sunnyvale would be required by its participation in the Municipal Regional Stormwater
Permit to ensure the Master Plan implements low-impact development source control (measures that retain and/or treat stormwater, such as cisterns, permeable pavement, and bioswales), site design, and stormwater treatment measures. Stormwater runoff from construction and operation of the proposed Master Plan improvements could degrade water quality; however, adherence to State and local regulations and permit requirements would minimize potential impacts to less-than-significant levels.

**Mitigation:** None required.

**Impact HYD-2:** The project would alter the existing drainage pattern in such a manner that could result in substantial erosion, siltation, or flooding, a less-than-significant impact with mitigation.

Creating impervious surface or otherwise altering drainage networks can change the characteristics of surface runoff such that new or additional erosion, siltation, or flooding can occur. Impervious surfaces essentially eliminate the process of infiltration, allowing a larger volume of precipitation to be transformed to surface runoff and conveyed more efficiently through the drainage network. As such, without proper drainage designs and/or pumping capacity, an increase in impervious surface area could result in earlier and larger peak flow rates during storm events and lead to an increase in flooding or ponding downstream. Alteration of the existing drainage pattern by activities such as grading and earth movement can result in substantial erosion or siltation as surface water flows establish new drainage patterns to accommodate the topographic changes. Increased erosion can also occur if the amount or speed of water flowing through an existing drainage channel increases substantially. Placement of structures within a floodplain can also alter the existing drainage network such that flooding could occur in new areas.

In this analysis, impacts would be considered significant if increases in the volume and rate of runoff associated with proposed WPCP improvements would be sufficient to result in substantial erosion, siltation or flooding of adjacent areas.

**Construction**

**Main Plant Site.** During construction of all WPCP improvements, grading and excavation activities could result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. If graded areas and/or soil stockpiles are not managed properly and protected against stormwater flows, high sediment loads in stormwater runoff could clog drainage pipes, cause water pumps to malfunction, or otherwise decrease the carrying capacity of drainage channels, potentially resulting in increases in localized ponding or flooding. Without proper construction site practices, this would be a significant impact. As discussed in Impact HYD-1, the construction area within the main plant site would be graded such that stormwater runoff is collected and routed to the WPCP for treatment in order to maintain compliance with the WPCP’s NPDES permit (Order R2-2014-0035, NPDES Permit No. CA0037621). The City of Sunnyvale would be required to ensure contractors control erosion such that the WPCP
individual NPDES permit limitations continue to be met. While grading would temporarily alter the existing drainage network within the main plant site, construction BMPs would ensure that such alteration would not result in substantial erosion, siltation or flooding; the impact would be less than significant.

Outside the Main Plant Site. Construction of the improvements outside of the main plant site (Bay Trail access relocation, diurnal equalization and emergency storage) would require grading and in some cases placing fill in the existing drainage network. As discussed in Impact HYD-1, above, improvements outside of the main plant site would be required to comply with the Construction General Permit for stormwater discharges, which requires implementing BMPs that in effect control the overall stormwater runoff volume and rate from construction sites as well as protecting soils from erosion during storms. These measures have the beneficial effect of controlling flooding that might otherwise be caused by construction activities and preventing excessive sediment loads in stormwater runoff.

Smaller construction activities (e.g., upgrades to existing plant facilities) not requiring coverage under the CGP would nevertheless require compliance with Chapter 12.60, Stormwater Management, of the City of Sunnyvale municipal code and the Sunnyvale BMP Guidance Manual, which contains contractor requirements specific to surface drainage control during excavations, protection of exposed soils from stormwater, erosion control during landscaping, and best practices for trench dewatering.

Construction of improvements outside the main plant site could result in minor alterations to the existing drainage network, but would not result in substantial erosion, siltation, or flooding. Because implementation of a SWPPP is required for construction sites disturbing greater than one acre, and because smaller construction activities must abide by the City of Sunnyvale municipal codes, the potential impacts of erosion, sedimentation, or flooding caused by construction activities is considered less than significant and no additional mitigation measures are required.

Operation

Main Plant Site. Proposed Master Plan facilities within the WPCP would alter existing drainage patterns somewhat through new impervious surfaces and stormwater drainage system improvements. However the project would not substantially alter the impervious surface or topography within the main plant such that flooding would result, as proposed drainage systems would be sized to accommodate the amount of surface water expected at the site during a storm. Thus the improvements within the main plant site would not result in substantial erosion, siltation, or flooding.

Outside the Main Plant Site. WPCP improvements outside of the main plant site would include raising the existing levee, filling a portion of one of the oxidation ponds, and relocating the Bay Trail access point. To support raising the height of the existing levee, additional fill would be placed in Moffett and Cargill Channels. The amount of fill to be placed is not yet known; however, the fill could displace water in the channels during high flows, potentially resulting in multiple changes to flooding or erosion. Upstream flood water levels could increase as a result of
decreased channel conveyance along the widened levee. Increased fluvial flow velocities could lead to scour of the channel, manifesting either as a deepening of the main channel or erosion of the fringing marshes and/or the levee. Downstream channel size could also be affected as a result of filling the existing inter-tidal channel prism, limiting channel capacity. Implementation of Mitigation Measure HYD-2, Hydraulic Analysis of Levee Widening, would reduce the erosion, siltation, and flooding impacts of levee widening by ensuring that levee widening is designed to minimize changes that would affect channel capacity.

Mitigation Measures

Mitigation Measure HYD-2: Hydraulic Analysis of Levee Widening

Prior to design of the diurnal equalization and emergency storage facilities, or any Master Plan improvement that would require widening of the existing levee and road between the main plant and Pond 1, the City or its contractor will conduct a hydraulic analysis assessing the potential secondary effects of levee widening on water surface elevation and channel scour in Moffett Channel. Recommendations of the hydraulic analysis will be incorporated into project design and contractor specifications such that any changes to water surface elevation or the channel do not adversely affect channel capacity. The project will acquire a No-Rise Certification to confirm that the selected alternative will not cause an increase in water surface elevations along the Moffett Channel. This finding will be confirmed and certified by a registered professional engineer.

Conclusion: Less than Significant with Mitigation.

Impact HYD-3: Implementation of the Master Plan would place structures within a 100-year flood area, which could expose people or structures to a significant risk of loss, injury or death involving flooding, a less-than-significant impact with mitigation.

Main Plant Site. While the District’s planned Sunnyvale East and West Channels project will provide protection from fluvial flood hazards, FEMA mapping shows the entire main plant site, oxidation ponds, and portions of the relocated Bay Trail access within the 100-year coastal floodplain (FEMA Zone AE). Because the nearby pond levees do not meet certification criteria, FEMA mapping presumes that the pond levees are not present, thereby portraying inundation by Bay waters; wind waves are assumed to be limited and runup is neglected. USACE’s investigation takes into account the partial protection from coastal flooding provided by the pond levees and storage in the salt ponds themselves. Currently, FEMA is in the process of updating flood mapping for the San Francisco Bay shoreline areas to include flood and wave data. Preliminary FIRM panels generally increase the areas subject to coastal flooding in the project vicinity (FEMA, 2015b). To address coastal flooding at the WPCP, Master Plan improvements

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5 Fluvial flooding refers to flooding associated with rivers and streams. In the vicinity of the Master Plan area the District manages fluvial flooding via the Sunnyvale East and West channels. The West Channel abuts the main plant to the west while the East Channel is approximately 2,900 feet to the east of the Master Plan area.

6 The site is within an area designated as Special Flood Hazard Area Zone AE on Federal Emergency Management Agency Flood Insurance Rate Maps.
include establishment of a floodwall around the main plant site to protect it from tidal flooding. Improvements that would provide protection from tidal flooding include construction of concrete walls and vinyl sheet walls around the perimeter of the WPCP and installation of retractable floodgates at each entrance to the WPCP. The floodwall would be designed at an elevation of 13.0 feet\(^7\) to meet the protection criteria established by Santa Clara County. This would maintain WPCP operations under the predicted 100-year tidal flood event with sea level rise up to 50 years into the future, which is predicted at 12.24 feet (Carollo/HDR, 2013).

The placement of structures with the 100-year floodplain and establishment of a flood wall to protect the WPCP from coastal flooding would have the potential to alter or redirect flood waters to other nearby areas that might otherwise not flood. During the 100-year tidal flood event, the amount of water displaced by the floodwall would be approximately 33 acre-feet, assuming an average main plant elevation of 9 feet above sea level at the time that FEMA flood mapping was completed. Due to the scale of tidal flooding, which is a function of wave run-up and topographic elevations over large expanses of the shoreline, displacement of this volume of water would not affect surrounding water surface elevations during a tidal flood, or result in additional areas becoming inundated. Establishment of a floodwall to provide protection from tidal flooding would remove critical WPCP facilities from inundation during the 100-year tidal event, and enhance the ability of the WPCP to remain operational during such events. This is considered a beneficial impact compared to existing conditions.

Because the WPCP is currently within the 100-year flood zone and the proposed Master Plan would not change the number of employees at the WPCP, the project would not increase the number of individuals potentially exposed to injury or death resulting from flooding. Staff occupying the new facilities would be subject to the same notifications and procedures for emergency flood evacuation, if needed, that current WPCP staff follow. The City closely monitors rainfall due to its effects on wastewater flow and provides warnings to staff of potential flooding danger. In addition, community warning systems would continue to provide sufficient advance notification for evacuation outside of the flood hazard zones, if needed.

The Master Plan would replace the existing main plant facilities with facilities of improved structural integrity and would add a floodwall around the main plant site. The construction of the Sunnyvale East and West Channels project would further reduce the risk of loss associated with flooding at the site.

Improvements related to the South Bay Shoreline Study would also have the potential to address coastal flooding at the site, as the preliminary alignment of a future shoreline flood levee under consideration in the South Bay Shoreline Study would be in a position to protect the main plant. Implementation of the future shoreline levee in the Sunnyvale area may not occur until after the Master planning period. The shoreline flood levee would provide some level of flood protection for the WPCP in the future and is included as a cumulative project in Chapter 6, *Cumulative Impacts and Other CEQA Issues*. The City intends to work with agencies like the District and

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\(^7\) Shown on Master Plan documents as plant datum 113.0 feet. The convention of Master Plan engineering is to add 100 feet to the NAVD 88 elevation in order to make all elevations at the WPCP positive numbers.
USACE regarding tidal flood protection for the WPCP and vicinity, including Ponds 1 and 2 for as long as they continue to provide secondary treatment, and the diurnal equalization and emergency storage facilities.

**Outside the Main Plant Site.** The oxidation ponds, diurnal equalization tanks, and emergency storage facilities would be on the bay side of the proposed floodwall surrounding the main plant. However, as described in Chapter 3, Project Description, implementation of the diurnal equalization and emergency storage facilities would include raising the road by approximately 5-6 feet and fortifying and raising the existing berms and site area to an elevation of approximately 16 feet above sea level to accommodate sea level rise. This elevation is above the current FEMA-mapped 100-year flood elevation of 11 feet above sea level as well as above the recommended 100-year design water surface elevation of 12.24 feet (Carollo/HDR, 2013). When the water surface elevation is above the adjacent natural ground elevation (which it would be in this case, as the diurnal equalization tanks and pump station would be installed on fill material), three feet of freeboard is required with an additional one foot of freeboard required 100 feet on either side of structures that are within the leveed section of a creek (such as Moffett Channel) (Carollo/HDR, 2013). Additionally, the tanks and pipeline would be watertight by design. FEMA mapping and base flood elevations in the vicinity may change before these improvements are undertaken; however, based on current FEMA mapping the diurnal equalization tanks, pump station, and pipeline would be within the 100-year flood zone. To minimize the risk of damage and loss to the pump station, tanks, and pipeline due to the 100-year flood, Mitigation Measure HYD-3a, Flood Hazard Assessment and Design For Diurnal Equalization Tanks, Pump Station, and Pipeline, is recommended.

Implementation of the Master Plan would also include the decommissioning of the oxidation ponds, followed by potential restoration. As part of restoration, the existing levees surrounding Ponds 1 and 2 could be breached. Without adequate precaution, breaching of the levees could result in uncontrolled tidal scour of the levees and increased wave action and wave erosion of the levees landward of Pond 2. Breaching of the levee along the north side of Pond 1 could expose the emergency storage basins to increased wave action and erosion as well. In addition, while the levees around the oxidation ponds are not certified by FEMA, they do provide some coastal flood storage and protection of the landward areas from flooding, a function which could be lost by breaching of the levees during restoration. Implementation of Mitigation Measure HYD-3b, Restoration Plan for Ponds 1 and 2 and Mitigation Measure HYD-3c, Flood Protection Prior to Levee Breaching, would limit the adverse coastal flooding effects resulting from breaching levees as part of restoration.

With implementation of Mitigation Measures HYD-3a, HYD-3b and HYD-3c, the Master Plan’s potential to cause a significant risk of loss, injury or death due to flooding or placement of structures within the 100-year flood hazard area would be less than significant. Implementation of Mitigation Measure HYD-3a could widen and increase the height of proposed levees which in turn could affect additional sensitive habitat beyond that disclosed in Section 4.7, Biological Resources. Mitigation measures identified in Section 4.7 would still be anticipated to reduce impacts on biological resources within Moffett and Cargill Channels. Similarly, impacts to visual
quality disclosed could also be incrementally worse than disclosed in Section 4.15, Aesthetics, but could also be mitigated by implementation of Mitigation Measure AES-1.

### Mitigation Measures

**Mitigation Measure HYD-3a: Flood Hazard Assessment and Design For Diurnal Equalization Tanks, Pump Station, and Pipeline**

Prior to design of proposed WPCP improvements along Moffett Channel or within the oxidation ponds, the City will conduct a vulnerability analysis of project facilities to flooding, assess potential risks, and evaluate additional improvements that could reduce identified flood hazard risks. The evaluation will identify the flood safe elevation (FSE) as the sum of the (then) current base flood elevation (BFE) for the project area, the projected sea level rise during the project’s design service lifetime, and additional three to four feet of freeboard as determined necessary by a registered professional engineer. The risk assessment will address the construction and design of facilities below the FSE and the potential for significant loss, injury, or upset that could result from flooding, and identify feasible measures that could reduce flood hazard risks. Project design will incorporate the findings from the flood hazard assessment. Project design measures could include, but are not limited to, the following:

- Elevating the ground floor elevation of the diurnal equalization pump station above the FSE;
- Anchoring structures to prevent flotation, collapse and lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
- Design of the extension of the primary effluent pipeline and associated support structures to minimize corrosion and ensure stability during occasional flooding;

The flood hazard assessment and selected design improvements for implementation shall be certified by a registered professional engineer to avoid a substantial risk of loss involving flooding.

**Mitigation Measure HYD-3b: Restoration Plan for Ponds 1 and 2**

Prior to restoration of the oxidation ponds, the City shall develop a restoration plan for the oxidation ponds, to be implemented upon decommissioning. The plan must include:

- Hydraulic analysis of the flooding and erosion effects resulting from breaching the levees surrounding Ponds 1 and 2.
- An assessment of the effects of breaching on the floodplain surrounding the WPCP.
- Regular inspection of the diurnal equalization and emergency storage facilities in coordination with a qualified engineer following breaching to look for evidence of erosion that appears to be associated with restoration of Ponds 1 and 2. If inspections identify excessive erosion, develop and implement a plan to protect the diurnal equalization and emergency storage facilities.
• Restoration designs that reflect recommendations made by a qualified engineer.

**Mitigation Measure HYD-3c: Flood Protection Prior to Levee Breaching**

The City of Sunnyvale shall not breach levees to restore Ponds 1 and 2 until adequate flood protection is provided for the landward uses that could be affected by such breaching, as determined in the assessment of effects to the surrounding floodplain included in the Restoration Plan for Ponds 1 and 2.

**Conclusion:** Less than Significant With Mitigation.

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**Impact HYD-4: Construction activities at the WPCP would temporarily lower the groundwater table, a less-than-significant impact.**

Construction of the WPCP improvements would require dewatering of excavations to facilitate construction. Groundwater removed by dewatering during construction would be routed to the primary facility for treatment. Groundwater levels at the WPCP are about -4 feet NAVD 88, corresponding to about 15 feet below ground surface in most areas of the main plant. Depth of excavation for some facilities could encounter groundwater. Therefore, installation of WPCP facilities would likely require dewatering of excavations during construction.

Groundwater dewatering involves the removal of water from the excavation at a rate equal to or greater than the rate of groundwater entering the excavation. This is typically accomplished by the use of surface pumps, submersible pumps, and in some cases, by the use of extraction wells placed at a given distance around the excavation location. The purpose of dewatering is to lower the water table to below the depth of excavation to provide access to desired depth or facilitate dry construction of the foundation. At the main plant site, groundwater would be temporarily drawn down to two feet below the bottom of the lowest excavations (Fugro, 2015).

Construction dewatering could temporarily affect the local shallow aquifer in the vicinity of excavated areas. While the shallow aquifer is not used as a source of municipal drinking water, in the landfill area surrounding the WPCP this aquifer is controlled to protect surface and groundwater quality. In areas under the proposed Administration Building, near one margin of the landfill, groundwater was encountered at 11 feet bgs during geotechnical boring (Fugro, 2015). Without adequate precautions, construction dewatering could redirect local shallow groundwater flow from the current condition to the excavated areas, potentially affecting the current groundwater control system’s efficacy at protecting surface and groundwater quality.

As described above in Section 4.9.2.3, the City of Sunnyvale is currently under order from the RWQCB to control the buildup of leachate from the landfill (RWQCB, 2004). Although regional shallow groundwater flows north, shallow groundwater beneath the landfill is influenced by surface water ponds, channels, ditches, storm drain pipelines, and sanitary sewers, which result in a generally radial flow of groundwater toward the center of the landfill (RWQCB, 2004). A Corrective Action Program approved by the RWQCB is based on hydraulic capture of
groundwater flow toward existing groundwater sinks (areas of relatively low groundwater pressure, toward which groundwater will preferentially flow), primarily sanitary sewer pipelines and the WPCP (RWQCB, 2004). Sanitary sewers are located along Borregas Avenue and Carl Road and within the WPCP (SCS, 2012a). Historic water quality monitoring indicates hydraulic capture by groundwater flow toward these sinks has provided control consistent with the objectives of the Corrective Action Plan (SCS, 2012b).

The geotechnical study prepared for the Master Plan (Fugro, 2015) includes groundwater controls to be implemented during construction, which are designed to limit the extent of influence of construction dewatering. Geotechnical recommendations for the project include the installation of temporary, impermeable shoring such as interlocking sheet pile driven well below the bottom of the excavation. This construction method would likely result in less groundwater pumping during excavation, limiting the effect of construction dewatering on the surrounding groundwater flow regime. The installation of monitoring wells on either side of the excavation or shoring is also recommended in the geotechnical report. These groundwater controls would reduce the effect of the Master Plan on surrounding groundwater, thus reducing the potential for alteration of the current groundwater flow and associated water quality impacts as a result of the Master Plan. As described above in Section 4.9.2.3, material changes to the landfill site (such as excavation and construction dewatering for the Administration Building) may not be made without approval by the RWQCB. In compliance with the landfill WDRs, the City would submit a technical report to the RWQCB, at least 120 days prior to any material change in landfill site operations or features, specifying components of the Administration Building construction and design necessary to maintain the integrity of the landfill cap and prevent water quality impacts, and would secure RWQCB approval before proceeding with Administration Building construction. The City would also notify the County of Santa Clara Department of Environmental Health prior to conducting work within 1,000 feet of the closed landfill as required by state law and described in Section 4.2, Land Use and Recreation. The impacts of construction dewatering on local groundwater would thus be less than significant.

Operation of the WPCP improvements would not involve additional extraction of groundwater. No long-term adverse impacts on groundwater levels, in shallow or deep aquifers, are expected from implementation of the WPCP improvements proposed in the Master Plan.

**Mitigation:** None required.

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8 California Code of Regulations Title 27, Division 2, Section 21190.
4.9.3.5 WPF Impacts and Mitigation Measures

Impact WPF-HYD-1: The WPF would generate additional sources of stormwater runoff that could degrade water quality, a less than significant impact with mitigation.

The WPF would include potential construction of purified water pipelines, installation of 18 injection wells (each with an approximately 20 foot by 20 foot concrete pad), and use of the existing recharge basins near Los Gatos Creek. The form and use of the recharge basins would be unchanged by the WPF; therefore, the recharge basins are not evaluated further in this impact discussion.

With respect to WPF improvements implemented at the WPCP, the impacts to stormwater quality would be identical to those described for the Master Plan in Impact HYD-1, above, and would be less than significant.

Construction

Pipelines and Injection Wells. Construction-related stormwater runoff from portions of the purified water pipeline and the injection wells, as well as any water flushed from the pipelines or wells during testing prior to commissioning, would discharge to the local storm drain systems that ultimately discharge to creeks such as Calabazas, Saratoga, San Tomas Aquino, and Los Gatos, and to San Francisco Bay. Exposed soil from stockpiles and excavated areas could be transported by wind or stormwater and, if not properly managed, could accumulate in storm drains and increase the sediment load (turbidity) in the stormwater runoff as well as reduce the flood carrying capacity of the drains. In addition, construction activities would use hazardous materials such as adhesives, solvents, paints, and petroleum lubricants, which, if not managed appropriately, could become mobilized by run-off and contribute to non-point source pollution (see also Section 4.11, Hazards and Hazardous Materials, for a discussion of project impacts regarding hazardous materials used during construction). Temporary storage of construction materials and equipment in work areas and staging areas also creates the potential for a release of hazardous materials or sediment to the storm drain system.

Construction of the purified water pipelines and injection well sites would require compliance with the CGP, as they would be linear or related features disturbing more than one acre. As described above, the CGP requires preparation of a SWPPP containing BMPs to minimize the impacts of project construction on surface water flow rates, sedimentation and erosion, and water quality. Calabazas, Saratoga, San Tomas Aquino, and Los Gatos creeks are considered sediment-sensitive water bodies because they have beneficial uses of cold freshwater habitat. Because of the sensitivity of these water bodies and the proximity of construction to the creeks, impacts related to degradation of water quality as a result of erosion and sedimentation or release of other water quality pollutants during construction would be potentially significant at these creek crossings.

If pipeline construction occurs within the 100-year flood zones of Calabazas, Saratoga, San Tomas Aquino, or Los Gatos Creek, impacts related to release of pollutants, erosion or siltation on- or offsite during construction would be potentially significant. Implementation of Mitigation
Measure WPF-HYD-1a, Schedule Construction Activities at Creek Crossings During the Dry Season, requiring contractors to schedule construction activities in the 100-year flood zone during the dry season (i.e., between June 1 and October 15) would reduce this impact to less than significant by ensuring that construction debris and equipment are not subjected to flooding and heavy winter storms that could overwhelm construction BMPs implemented as part of the SWPPP and result in the discharge of pollutants to these water bodies.

Operation

Pipelines. Pipeline trench excavations would be restored to their pre-project conditions following construction. Once installed, the purified water pipelines would not substantially alter the extent of pervious surface or otherwise provide substantial additional polluted runoff because they do not result in more impervious surface than currently exists. However, without adequate design, pipeline crossings of stream channels could result in channel scour during high flow events which could adversely affect beneficial uses of the stream channels. Pipeline scour can result if surface crossings are not constructed high enough to remain above the highest possible stream flows at each crossing, or if subsurface crossings are not buried deep enough to remain undisturbed by scour throughout passage of peak flow. Implementation of Mitigation Measure WPF-HYD-1b, Hydraulic Analyses for Stream Crossings, would reduce the risk of water quality degradation at stream crossings.

Injection Wells. In the vicinity of the injection wells, stormwater flows through storm drains and underground culverts to nearby streams. Each injection well would include a 400-square foot concrete pad, in mostly urbanized areas. The total area of the concrete pads would be 7,200 square feet (less than 0.2 acre). However, the District would be required by its participation in the Municipal Regional Stormwater Permit to ensure that low-impact development source control (measures that retain and/or treat stormwater, such as cisterns, permeable pavement, and bioswales), site design, and stormwater treatment measures are implemented for the injection well pads. Stormwater runoff from operation of the injection wells could degrade water quality; however, adherence to State and local regulations and permit requirements would minimize potential impacts to less-than-significant levels.

Mitigation Measures

Mitigation Measure WPF-HYD-1a: Schedule Construction Activities at Creek Crossings During the Dry Season

The SWPPP, to be submitted in accordance with the Construction General Stormwater Permit, will include a schedule for construction activities that specifies a timeline for earthmoving activities, hydroseeding, and stabilization of soils and slopes. Incorporate into contract specifications that, in addition to the requirements of the Construction General Stormwater Permit, the contractor will limit construction activities within the 100-year flood zone of Los Gatos Creek to the dry season. The schedule will indicate that all earthmoving activities at these creeks will occur during the dry season (i.e., between June 1 and October 15), unless otherwise negotiated with the appropriate regulatory agencies.
Mitigation Measure WPF-HYD-1b: Hydraulic Analyses for Stream Crossings

To reduce the potential for water quality degradation resulting from stream scour, during the design phase of the WPF pipelines hydraulic analyses shall be completed for all stream crossings. The following considerations shall be included in the hydraulic analyses:

- Surface crossings should be located above the 100-year flood elevation, and preferably above the 500-year flood elevation
- Subsurface crossings should be designed to account for channel degradation (lowering of the stream bed), the detection of which could be based upon comparative channel survey data, specific gauge analysis (plotting the change in stream stage over time at one stream gauge location), bridge inspection reports, or other quantitative techniques;
- Subsurface crossings design should also address the potential for contraction scour within the affected stream reach

Conclusion: Less than Significant with Mitigation.

Impact WFP-HYD-2: The project could temporarily or permanently alter drainage patterns by installing pipelines across or under creeks, a less than significant impact with mitigation.

WPF construction activities that could temporarily or permanently affect drainage patterns, rate of surface runoff, or volume of surface runoff include installation of pipelines and injection wells. The topography of the recharge basins would be unchanged by the WPF; therefore, the recharge basins are not evaluated further in this impact discussion and no subsequent CEQA evaluation regarding hydrologic impacts of the use of the recharge basins would be required.

With respect to WPF improvements implemented at the WPCP, the impacts to drainage patterns would be identical to those described for the Master Plan in Impact HYD-2, above, and would be similarly mitigated.

Construction

Pipelines. The exact locations of WPF pipelines currently are not known; however, construction activities associated with WPF pipeline construction would occur primarily within streets and existing easements. As discussed above in Section 4.9.1, the injection well area is traversed by the 100-year flood zone along Calabazas, Saratoga, and San Tomas Aquino Creeks. WPF pipelines may cross or require installation near these creeks, and could temporarily alter creek drainage by routing creek flow around construction areas or by accidental fracout during subsurface pipeline installation. The pipelines may also cross the 100-year flood zone along these creeks. Construction across these creeks could temporarily result in flooding if construction occurs during the wet season. If the WPF construction activities combined would disturb more than one acre of land and are considered part of a common plan of development, compliance with the Construction General Permit would be required. As described above, the CGP requires
preparation of a SWPPP and implementation of construction stormwater BMPs to reduce the impacts of a project on surface water flow rates, sedimentation and erosion, and water quality. Implementation of Mitigation Measure WPF-HYD-1a, above, would further limit the potential for construction to alter drainage patterns.

**Injection Wells.** Injection well construction could include drilling wells, installing well casings and/or well heads, and pouring 200-square foot concrete pads. Depending on the depth of the wells, drilling may include the use of drilling fluid requiring storage. As noted above, any well construction within drainages would occur in accordance with agency permits to avoid the installation of structures that could redirect stream flow.

**Operation**

Pipeline trench excavations would be restored to their pre-project conditions following construction. Once installed, the pipelines would not substantially alter existing topography or drainage, as they generally would be installed within existing streets. The pipelines also would not substantially affect the rate or volume of surface runoff with regards to flooding, as the pipelines would generally be installed within existing streets that are already paved and thus would not create additional impervious surface.

However, the pipelines could permanently alter creek flow if the pipelines cross creeks. Pipelines located within drainage areas, such as Calabazas Creek, Saratoga Creek, or San Tomas Aquino Creek, would be installed either at the surface or buried under the creek beds. While installation of these pipelines in accordance with resource agency permits (e.g., USACE, RWQCB, California Department of Fish and Wildlife, permits listed in Table 3-4) would reduce the potential for the pipelines to redirect flow in these drainages, pipeline crossings of stream channels could result in channel scour during high flow events which could adversely affect existing drainage patterns. However, with implementation of Mitigation Measure WPF-HYD-1b, Hydraulic Analyses for Stream Crossings, and compliance with the required permits, long-term of the pipelines on erosion, siltation, or flooding would be less than significant.

**Injection Wells.** Although no specific sites will be identified until engineering feasibility studies are completed (described in Chapter 3, Project Description), preliminary land uses of sites considered to date include open space, parks, public-use (i.e., schools), and residential parcels. Although the injection well area is large, the infrastructure needed for each of the up to 18 injection wells would be minimal (generally less than 400 square feet per well). The installation of concrete pads of up to 400 square feet could affect water infiltration in the immediate area; however, the concrete pads would not substantially limit or alter the land cover such that existing flood patterns would change or such that substantial erosion or sedimentation on- or offsite would result. The volume, pattern, and rate of drainage would not be substantially altered, and the impact would be less than significant.
Mitigation Measures

Implement Mitigation Measures WPF-HYD-1a (Schedule Construction Activities at Creek Crossings During the Dry Season) and WPF-HYD-1b (Hydraulic Analyses for Stream Crossings).

Conclusion: Less than Significant with Mitigation.

Impact WPF-HYD-3: The WPF could expose structures to loss resulting from flooding, and could place structures within a 100-year flood hazard area, a less than significant impact with mitigation.

With respect to WPF improvements implemented at the WPCP, the impacts related to flooding would be identical to those described for the Master Plan in Impact HYD-3, above, and would be similarly mitigated.

The WPF pipelines, injection wells, and recharge basins would not involve construction of housing or structures for human occupancy, thus it would not expose people or the public to loss, injury, or death as a result of flooding.

Construction

Pipelines. As discussed in the Setting, above, the WPF pipelines could traverse areas within the 100-year flood zone (as shown on Figure 4.9-2). Special flood hazard areas are located in Sunnyvale, Santa Clara, Cupertino, San Jose, and Campbell. Most are located along creeks in these municipalities. With the exception of locations where the pipelines would cross creeks, the pipelines would be installed within existing streets, and would not substantially alter existing flood flows. Pipelines located within drainage areas, such as Calabazas Creek, Saratoga Creek, or San Tomas Aquino Creek, could redirect flood flows within these 100-year flood areas unless appropriately designed. Pipelines installed across creeks would be required to comply with resource agency permits (e.g., USACE, RWQCB, California Department of Fish and Wildlife, permits listed in Table 3-4) to avoid the installation of structures that could redirect flow in these drainages.

Temporary alteration of drainage patterns or impedance or redirection of flood flows during construction activities associated with pipelines crossing these creeks would be a potentially significant impact if flooding were to occur during construction at these locations. Implementation of Mitigation Measure WPF-HYD-1a, Schedule Construction Activities at Creek Crossings During the Dry Season, requiring the construction contractor to schedule construction activities at these locations during the dry season, would reduce this impact to less than significant by ensuring that construction activities would be conducted during the dry season when flooding would not occur.
Operation

Pipelines. As noted above, most special flood hazard areas that pipelines would encounter are located along creeks. With the exception of locations where the pipelines would cross creeks, the pipelines would be installed within existing streets, and would not substantially alter existing flood flows during operations. However, pipelines that cross creeks would be installed within the 100-year flood areas could redirect flood flows if not adequately designed. Implementation of Mitigation Measure WPF-HYD-1b, Hydraulic Analyses for Stream Crossings, would reduce the risk of redirecting flood flows by requiring that pipelines are designed to be built above the 100-year flood elevation or buried to a depth that has a low risk of being disturbed during a flood event. With the implementation of Mitigation Measure WPF-HYD-1b, the impact of pipeline crossings on flood flows would be less than significant.

Injection Wells. The injection well area generally is not within the 100-year special flood hazard area, with the exception of the Calabazas, Saratoga, and San Tomas Aquino Creek channels that traverse the injection well area. If the WPF constructed the injection wells within these creek channels, the injection well infrastructure would be exposed to flooding and but would not substantially impede or redirect flood flows. If flooding occurs, the injection well surface structures (such as pump stations) could be damaged but damage would be repairable and thus, potential impacts are considered less than significant.

Recharge Basins. In addition to FEMA special flood hazard areas, the WPF recharge basins, and any associated pipelines, would be located within the dam inundation area of Lenihan Dam. Should dam failure occur on the Lenihan Dam, the recharge basins and associated pipelines could experience flooding. Catastrophic failure of a dam is an extremely unlikely event; dam safety regulations enforced by the Department of Water Resources, Division of Safety of Dams require periodic inspections of dams and reservoirs for the purpose of determining their safety. Inspectors may require dam owners to perform work, maintenance, or implement controls if issues are found with the safety of a dam. If the Lenihan Dam fails, the recharge basins would be affected but not irrevocably damaged. In the unlikely event that a dam was to fail, it would represent an inspection and repair issue rather than a significant impact on the project. Potential impacts are thus considered to be less than significant.

Mitigation Measures

Implement Mitigation Measures WPF-HYD-1a (Schedule Construction Activities at Creek Crossings During the Dry Season) and WPF-HYD-1b, Hydraulic Analyses for Stream Crossings.

Conclusion: Less than Significant With Mitigation.
Impact WPF-HYD-4: The WPF would affect groundwater levels and storage during construction or recharge operations, a less-than-significant impact.

The construction of the WPF components could encounter groundwater and dewatering activities would alter local groundwater levels. The operation of the WPF groundwater replenishment facilities could alter groundwater levels by the infiltration of water from the recharge basins or by the injection of water. Over time, use of recycled water as a source for groundwater replenishment would be expected to have a beneficial effect on groundwater levels.

With respect to WPF improvements implemented at the WPCP, the impacts to groundwater levels and storage would be identical to those described for the Master Plan in Impact HYD-4, above.

Construction

Pipelines. The WPF purified water pipelines would be constructed in existing roads and easements. The depth of excavation to install these pipelines may vary in order to maintain the necessary hydraulic gradient of the pipelines. Depending on the depth of excavation, pipeline installation activities could encounter groundwater and would likely require dewatering of excavations during construction. Construction dewatering is described in Impact HYD-4, above.

The impact to groundwater during pipeline installation, if any, would be temporary and confined to the immediate vicinity of the excavation. The affected groundwater would be from the shallow aquifer, which is not used as a source of municipal drinking water. Further, the influence of pumping (i.e., cone of depression) would not extend far from the excavation and the dewatering would be temporary. For these reasons, the impacts of pipeline installation with respect to depletion of groundwater supplies would be less than significant.

Injection Wells. Construction of the WPF injection wells could include some temporary and confined groundwater pumping in the vicinity of as a result of the installation of the well. As the well is constructed, some groundwater may be returned to the surface during drilling. Subsequently, the injection well would be developed to remove sediment from the well and surrounding filter pack. The process of well development removes limited amounts of groundwater. However, due to the limited and temporary pumping needed during construction, the influence of pumping would not extend far from the excavation and would not result in a significant deficit in aquifer volume or lowering of the groundwater table.

Recharge Basins. The recharge basins are currently in use and no changes to the basins are proposed. No construction impacts to groundwater at the recharge basins would occur.

Operation

Pipelines. Operation of the purified water pipelines would not involve additional extraction of groundwater. No long-term adverse impacts on groundwater levels in shallow or deep aquifers are expected from installation of the WPF purified water pipelines.
**Injection Wells.** The operation of the injection wells would result in increased groundwater recharge to municipal groundwater supplies in the area of the injection wells and farther downgradient in the Santa Clara Valley. During this process, purified water from the WPCP would be pumped to the injection wells, down to the well screens between 500 and 800 feet below the ground surface, and outward into the aquifer. The addition of this water would raise the groundwater levels in the local vicinity of the injection wells, creating a local mounding effect. Groundwater elevations average around 77 feet amsl in the vicinity of the area proposed for injection wells. The local ground surface elevations range from about 200 to 240 feet amsl, meaning that the depth to groundwater (and thus the thickness of unsaturated sediments) ranges from about 120 to 160 feet. Given this thickness of unsaturated sediments, the addition of the injected water would not be expected to rise to or near the ground surface. Instead, the water would flow into the aquifer, increase groundwater levels, and increase the volume of water in storage. The maintenance and/or increase in groundwater levels would reduce the risk of land subsidence caused by groundwater overdraft. Injecting purified water into the groundwater basin would augment groundwater supplies or would replace imported water when it is less available.

**Recharge Basins.** Operation of the Los Gatos recharge basins for surface groundwater replenishment would continue with implementation of the WPF. Implementation of the WPF may result in more water infiltrating through the recharge basins than presently occurs. The added water would infiltrate downward to the underlying aquifer. Some water would be retained in pores spaces of the unsaturated sediments, but most of the water would migrate downward to the underlying aquifer, about 120 to 160 feet below the ground surface. Similar to the use of injection wells discussed above, the water would merge into the aquifer, maintaining and locally increasing groundwater levels and the volume of groundwater in storage. The maintenance and increase in groundwater levels would reduce the risk of land subsidence caused by groundwater overdraft. The increase of the volume of water in storage would augment groundwater supplies or would replace imported water when it is less available.

**Mitigation:** None required.

### 4.9.4 References


California Natural Resources Agency, *2009 California Climate Adaptation Strategy*. 


City of San José, 2013. San Jose/Santa Clara Water Pollution Control Plant Master Plan First Amendment to the Draft EIR. October 2013.


San Francisco Bay Conservation Development Commission, 2011, Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline, September 2011 update.


SCVWD, 2015. Personal communication between Thomas Mohr, SCVWD, and Karen Lancelle, ESA.


4. Environmental Setting, Impacts and Mitigation Measures

4.9 Hydrology


4.10 Water Quality

This section describes the existing surface and groundwater quality within and surrounding the planning area for the Sunnyvale Water Pollution Control Plant (WPCP) and the Water Purification Facilities (WPF) groundwater replenishment facilities area south of the WPCP, and presents applicable regulations that pertain to water quality related to discharges associated with the implementation of the WPCP Master Plan (Master Plan) or WPF. For a discussion of potential surface and groundwater hydrological impacts and the impacts associated with the discharge of stormwater during construction and operation and with flooding, see Section 4.9, Hydrology.

4.10.1 Setting

4.10.1.1 Surface Water Quality

South San Francisco Bay

The WPCP is located in the Lower South San Francisco Bay Basin. The WPCP, along with the Moffett Channel to which the treated water discharges from the WPCP, lies within the Santa Clara hydrological basin (RWQCB, 2013). The Moffett Channel flows into Lower South San Francisco Bay through Guadalupe Slough (see Figure 3-2).

Surface waters in the San Francisco Bay region consist of inland surface water (freshwater lakes, rivers, and streams), estuaries, enclosed bays, and ocean waters. Water quality in the Bay is influenced by historical and ongoing waste loads contributed to the surface water bodies in the region from upstream discharges. These discharges are carried into the region via Delta outflow, direct input in the forms of point and nonpoint sources, and indirect input via groundwater seepage (RWQCB, 2013).

A point source usually refers to waste emanating from a single, identifiable location, while a nonpoint source usually refers to waste emanating from diffuse locations. While legally considered point sources, stormwater systems are discussed as nonpoint sources because waste entering the systems is generated from diffuse sources. Waste loads from point sources are those that are generally associated with pollutant discharges from an identifiable location to a specific receiving water body. Major types of point sources include treated municipal sewage discharged from Publicly Owned Treatment Works, which often receive a combination of domestic, industrial, and commercial waste streams such as the Sunnyvale WPCP. Point sources also include treated industrial wastewater resulting from industrial operations, processing, cleaning, and cooling (RWQCB, 2013). The Sunnyvale WPCP is one of the municipal wastewater treatment facilities within the San Francisco Bay region that provides advanced treatment to wastewater and discharges directly into surface waters (RWQCB, 2013).

Water quality in the southern portion of San Francisco Bay is affected by a variety of factors, including saltwater influx from the Pacific Ocean, freshwater influx from the Sacramento–San Joaquin River Delta, freshwater influx from local streams and tributaries, and various
anthropogenic sources of pollutants. As discussed in Section 4.10.2, South San Francisco Bay is designated as ‘impaired’ for nine constituents, which by definition do not meet water quality standards discussed further below.

**Local Watershed**

The WPCP is located in the Guadalupe Slough watershed (The Oakland Museum of California Creek and Watershed Information Source, 2015). Figures 3-2 and 4.9-1 show creeks and other water bodies in the Master Plan and WPF areas. Guadalupe Slough – a tributary to South San Francisco Bay – receives flows from San Tomas Aquino Creek, Saratoga Creek, Calabazas Creek, and the Sunnyvale East and West Channels and extends northwest through the salt flats to the southern end of the Bay. The section of the Moffett Channel that receives discharge from the WPCP is located adjacent to and north of the WPCP and flows into Guadalupe Slough and eventually into the Lower South Bay (RWQCB, 2009).

In addition to the WPCP discharge, Moffett Channel carries stormwater delivered from the Sunnyvale West Channel into the Lower South Bay. The Sunnyvale East and West Channels, constructed by the Santa Clara Valley Water District (District) in the 1960’s for flood protection, currently function as engineered water conveyance channels that collect and transport stormwater runoff from urban areas in Sunnyvale and Cupertino to the Lower South Bay. These surface water drainages, managed by the District, discharge into Moffett Channel and/or the Guadalupe Slough and, ultimately, to the Bay.

A study of the receiving water conditions conducted by City of Sunnyvale (2012) describes the complex, significantly tidally influenced Moffett Channel and Guadalupe Slough system. Increased mixing and dilution occur from the point where the treated wastewater from the WPCP is discharged into Moffett Channel and as it progressively moves down the channel into Guadalupe Slough, and into the Lower South Bay (City of Sunnyvale, 2012). Monthly depth profiles (i.e., surface to bottom plots) at six locations closest to the outfall in Moffett Channel showed elevated salinity levels during August through November and lower salinity levels from January through June. pH was highest in Moffett Channel during high tide conditions when the higher pH and salinity Bay water moves up into the channel. The pH-salinity-relationship was reported to be not as strong in Guadalupe Slough. On average, the pH in the Guadalupe Slough was higher (~8) than in Moffett Channel (~7.5) for the same time periods. During rainfall events, the pH was lower and had less variability, especially in Moffett Channel (City of Sunnyvale, 2012). Monitoring also supports the conclusion that there is consistent (at least 1-2 fold) dilution occurring within 2000 feet downstream of the discharge location. Receiving water conditions are complex in the significantly tidally influenced Moffett Channel and Guadalupe Slough system. Initial dilution evaluations confirm that mixing and dilution increase from the discharge point as it progressively moves down Moffett Channel, into Guadalupe Slough, and into the Lower South Bay (City of Sunnyvale, 2012).
Oxidation Ponds 1 and 2

Two oxidation ponds are currently used as part of the secondary treatment process at the WPCP (see Figure 3-2 in Chapter 3, Project Description). Pond 1 is located approximately 1,800 feet north of the main plant and Pond 2 is located approximately 670 feet northwest of the main plant. Both ponds are approximately four feet deep. Pond 1 has a surface area of approximately 100 acres, while Pond 2 has a surface area of approximately 300 acres. The ponds are treatment facilities, and are not Waters of the U.S. or State.

Santa Clara Valley Water District Pond A4

Santa Clara Valley Water District Pond A4, with an approximately 310-acre area, is located northeast of the main plant and southwest of Guadalupe Slough, approximately 2.5 miles from its confluence with Lower South Bay. Formerly a salt evaporator pond, SCVWD Pond A4 is owned and maintained by the District as part of tidal marshland restoration project to meet requirements for the District’s Stream Maintenance Program and for the Lower Guadalupe River Project. (USACE, 2002). The pond does not directly receive surface water from the Bay, although it is likely hydrologically connected by groundwater to the surrounding water bodies. SCVWD Pond A4 is regularly managed by the District to prevent water quality problems, such as high salinity, by pumping water to Pond A5. Pumping to Pond A5 draws cleaner water from Cargill Channel into SCVWD Pond A4 via a siphon, promoting pond circulation (SCVWD, 2013).

Mercury

Mercury occurs naturally in the Bay environment and has been introduced as a contaminant in various chemical forms from a variety of anthropogenic sources. Ambient levels of sediments in the Bay are elevated in total mercury above naturally occurring background levels. Although mercury often resides in forms that are not hazardous, it can be transformed through natural processes into toxic methylmercury.

The primary concern with mercury contamination in the Bay is the accumulation of methylmercury in organisms, particularly at the top of aquatic food webs. Methylmercury typically represents only about 1 percent of the total of all forms of mercury in water or sediment, but it is the form that is readily accumulated in the food web and poses a toxicological threat to exposed species (Davis et al., 2012). Methylmercury has a complex cycle, influenced by many processes that vary in space and time. The rate of methylation is a function of an array of variables, including mercury levels, mercury speciation, oxidation reduction potential, microbial activity, sulfate levels, salinity, pH, dissolved oxygen, dissolved organic carbon, turbidity, solar radiation, and vegetation type. Although the interaction of these variables is not fully understood, wetlands are known to be significant sites of microbial methylation and potentially important sources of methylmercury to aquatic food webs (Hunt and Davis, 2005). Natural accretion processes in salt marshes continually supply fresh layers of mercury contaminated sediments, which can release mercury in a form that can become biologically available to mercury-methylating bacteria and subsequently bioaccumulate in the food chain.
4.10.1.2 Groundwater Quality

Santa Clara Valley Groundwater Basin

The Master Plan area is located in the Santa Clara Valley Groundwater Basin (DWR, 2013). The Santa Clara Valley drains to the north through tributaries to San Francisco Bay including Coyote Creek, the Guadalupe River, and Los Gatos Creek. Refer to Section 4.9, Hydrology, for the hydrological features of the basin. According to the DWR’s Groundwater Bulletin 118, groundwater in the major producing aquifers within the Santa Clara Valley Groundwater Basin is generally of a sodium and calcium bicarbonate type. Although hard, the water is good to excellent in terms of mineral composition and suitable for most uses. Drinking water standards are met at public supply wells with no treatment (DWR, 2004).

Natural recharge in the groundwater basin occurs principally as infiltration from streambeds that exit the upland areas within the drainage basin and from direct percolation of precipitation that falls on the basin floor (DWR, 2004). The District actively recharges the groundwater basin via seven recharge facilities, releasing locally conserved or imported water to in-stream and off-stream facilities (DWR, 2004; SCVWD, 2003).

The District’s Managed Recharge Program is intended to sustain groundwater supplies through the effective operation and maintenance of the District’s recharge facilities. The Program consists of instream and off-stream recharge facilities (DWR, 2004; SCVWD, 2003), including Lexington Reservoir, Lenihan Dam, and the Coyote Creek, Los Gatos Creek and Guadalupe Recharge Systems.

The in-stream recharge accounts for about 45 percent of groundwater recharge in the District’s facilities. In-stream recharge occurs along stream channels in the alluvial apron upstream from the confined zone and through spreader dams. Los Gatos Creek is a major component of the District’s recharge facilities because it conveys water to recharge basins located downstream along San Tomas Expressway, Budd Avenue, Highway 17, and McGlincey Lane (SCVWD, 2003). Spreader dams (creating temporary or permanent impoundments in the stream channel) are a key component of the in-stream recharge program and increase the recharge capacity by approximately 10 percent (DWR, 2004).

Off-stream recharge facilities include abandoned gravel pits and areas specifically excavated for recharge purposes. Recharge from water delivered to these facilities accounts for approximately 35 percent of the recharge for the District (DWR, 2004).

High turbidity of incoming water results in a rapid decrease of recharge rates. In order to increase recharge basin efficiency, the District works to reduce turbidity levels with coagulants, mixing procedures, settling basins, and skimming weirs. Generally, water with turbidity levels of up to about 100 Nephelometric Turbidity Units (NTUs) can be treated effectively. Each NTU represents several pounds of fine-grained material per acre-foot of water (SCVWD, 2003).
Basin Management Programs and Activities

The Santa Clara Basin management plans that describe the District’s groundwater basin management programs and activities are described in the 2012 Groundwater Management Plan (SCVWD, 2012), and the 2014 Santa Clara Subbasin Salt and Nutrient Management Plan (SCVWD, 2014). The plans are summarized below with a focus on information relevant to the use of purified water that would be produced at the Sunnyvale WPCP as part of the WPF for groundwater replenishment.

2012 Santa Clara Valley Water District Groundwater Management Plan

In 2012, the District published the 2012 Groundwater Management Plan (2012 GWMP) to describe basin management objectives; the strategies, programs and activities that support those objectives; and measures to gauge performance. As described in the 2012 GWMP, the District’s objectives and authority related to groundwater management are to:

- Recharge groundwater basins
- Conserve, manage, and store water for beneficial and useful purposes
- Increase water supply
- Protect surface water and groundwater from contamination
- Prevent waste of the water supply
- Ensure sufficient water is available for present and future beneficial uses.

The District’s water supply system is comprised of storage, conveyance, recharge, treatment, and distribution facilities that include reservoirs, groundwater subbasins, out-of-county groundwater banking, groundwater recharge facilities, treatment plants, imported supply, and raw and treated water conveyance facilities. The District’s diverse water supplies include locally developed and managed water, imported water from the Sacramento-San Joaquin Delta, and recycled water.

Groundwater Quality

The District conducts groundwater quality monitoring to characterize regional groundwater quality conditions, determine the severity and extent of contamination, evaluate temporal trends in water quality, and identify any threats to groundwater to determine where further study or action is warranted to protect groundwater resources. Wells are chosen to provide adequate geographic representation throughout the Santa Clara and Llagas Subbasins. Monitoring includes both the shallow (150 feet and shallower) and principal (greater than 150 feet) aquifer zones.

The groundwater quality results indicate that at least 90 percent of wells in both the shallow and principal zones have stable or decreasing concentrations of total dissolved solids (TDS) and nitrate, and that nearly 90 percent of wells have stable or decreasing trends for chloride. TDS is used as an indicator of salt loading and of overall water quality. The salts from applied water remain in the soil layer, and can eventually be leached into groundwater by rainfall or over-irrigation. Some shallow aquifers adjacent to the San Francisco Bay have been affected by salt water intrusion and high TDS is noted in some wells close to the bay.
Nitrate trends are tracked because nitrate is a pollutant of concern that affects the largest number of wells in the County. Common sources of nitrate in groundwater are synthetic fertilizers, septic systems, and animal wastes. Elevated nitrate is common in the Llagas Subbasin due to historic and ongoing sources; however, there are also localized areas with nitrate concerns in the Santa Clara Subbasin. Chloride is used to measure potentially adverse trends related to salt water intrusion, which has occurred historically adjacent to San Francisco Bay. Evaluating long-term trends assesses the potential for renewed intrusion. Typically, very few wells sampled each year contain contaminants above primary maximum contaminant levels (MCL), also referred to as Primary Drinking Water Standards. Groundwater quality results for the Santa Clara Subbasin are summarized in the 2014 Santa Clara Subbasin Salt and Nutrient Management Plan and discussed below.

2014 Santa Clara Subbasin Salt and Nutrient Management Plan

In February 2009, the State Water Resources Control Board (SWRCB) adopted the statewide Recycled Water Policy that encourages increased use of recycled water and local stormwater, together with enhanced water conservation (Resolution 2009-0011). The Recycled Water Policy calls for basin-wide management of salts and nutrients from all sources with the goal of attaining water quality objectives and protecting beneficial uses of groundwater.

Because recycled water can contribute salts and nutrients to groundwater, the Recycled Water Policy requires local entities to develop a Salt and Nutrient Management Plan (SNMP) to support the permitting of new recycled water projects, while managing salts and nutrients basin-wide. The District prepared the SNMP for the Santa Clara Groundwater Subbasin with input from stakeholders (SCVWD, 2014). The purpose of the SNMP is to demonstrate compliance with the Recycled Water Policy by:

- Evaluating all sources of salt and nutrient loading to the Santa Clara Subbasin,
- Determining whether current and projected salt and nutrient concentrations are consistent with applicable Water Quality Objectives established in the San Francisco Bay Basin Plan,
- Developing recycled water and stormwater goals and objectives,
- Providing a plan for long-term groundwater monitoring, and
- Identifying sustainable measures to manage salt and nutrient loading to groundwater.

Study Area

The SNMP study area for the Santa Clara Groundwater Subbasin includes the Santa Clara Plain and the Coyote Valley. Groundwater typically provides about 45 percent of the water used by homes and businesses in the Santa Clara Plain. Tertiary-treated recycled water is used for irrigation and industrial purposes in Palo Alto, Mountain View, Sunnyvale, Santa Clara, San José, and Milpitas. Advanced-treated recycled water from the Silicon Valley Advanced Water Purification Center is now blended into recycled water serving San José and Santa Clara. The Coyote Valley relies almost entirely on groundwater, with small amounts of surface water used.
Water supply management in the Santa Clara Subbasin includes active groundwater replenishment operations conducted by the District. Significant volumes of imported water and surface water released from local reservoirs, along with local runoff, are used for recharge in basins and in-stream facilities. On average, the District’s Managed Recharge Program provides two-thirds of the annual pumping supply in the Santa Clara Plain.

**Existing Groundwater Quality**

Groundwater quality within the Santa Clara Subbasin is considered acceptable for all beneficial uses designated in the 2013 San Francisco Bay Water Quality Control Plan (Basin Plan). From the numerous chemical parameters analyzed for groundwater quality, TDS and nitrate (as NO₃) are used as representative salt and nutrient indicators for the SNMP. The existing groundwater quality using TDS and nitrate monitoring results as indicators are summarized below by aquifer. The aquifer assimilative capacity is included, as discussed further below.

**Trends and Assimilative Capacity**

As noted in Table 4.10-1, the concentrations of TDS and nitrate in the Principal Aquifer are below the Basin Plan Water Quality Objectives, set at the MCLs or drinking water standards. For the SNMP planning horizon ending in 2035, TDS concentrations are projected to increase in the Santa Clara Plain, although they will still be below the Basin Plan Objective. Nitrate is projected to decrease in the Santa Clara Plain, remaining below the Basin Plan Objective. The future trends are further projected in the assimilative capacity discussion below.

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<tr>
<th>Table 4.10-1</th>
<th>SUMMARY OF GROUNDWATER TDS AND NITRATE CONCENTRATIONS IN SANTA CLARA PLAIN - OVERALL</th>
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<tbody>
<tr>
<td>Santa Clara Plain – Overall</td>
<td>TDS (mg/L)</td>
</tr>
<tr>
<td>Basin Plan Objective (Secondary MCL)</td>
<td>500</td>
</tr>
<tr>
<td>Volume Weighted Average</td>
<td>425</td>
</tr>
<tr>
<td>Assimilative Capacity</td>
<td>75</td>
</tr>
</tbody>
</table>

NOTES: The Basin Plan Objectives are set at the Primary or Secondary MCLs. TDS and nitrate are Secondary MCLs. The assimilative capacity is the difference between the Basin Plan Objective and the average groundwater concentration (negative value indicates no assimilative capacity is available).

SOURCE: SCVWD, 2014, Table 3-22

Assimilative capacity is the difference between the ambient groundwater quality and the Basin Plan Objective. The Recycled Water Policy stipulates that the available assimilative capacity should be calculated using the most recent five years of available data or a time period approved by the RWQCB. The SNMP uses data from 2008 through 2012 to calculate assimilative capacity. To evaluate the projected future groundwater quality concentrations, the SNMP estimates the annual current and future salt and nutrient loading of the aquifer by estimating the loading from a variety of sources, including rainfall, mountain-front recharge, managed recharge in streams,
managed recharge in recharge basins, agricultural irrigation, landscape irrigation from municipal, domestic, and recycled water source, conveyance losses, drainage losses, agricultural and lawn fertilizer, and atmospheric deposition. The annual volume of salt and nutrient removal from the aquifer are estimated from groundwater pumping, basin outflow, gaining reaches of streams, groundwater infiltration into sewer lines and storm drains, and storm drain infiltration. Subtracting the removals from the loading provides an estimate of how much additional loading the aquifer can take without exceeding the Basin Plan Objectives. The TDS and nitrate projected concentration trends, net loading, and assimilative capacity from 2010 through 2035 are shown in Figures 4.10-1 and 4.10-2 below. Based on the salt and nutrient loading estimates, the District concluded that there is available assimilative capacity within the aquifers.
4.10.2 Regulatory Setting

The regulatory setting applicable to the Master Plan and WPF is geared toward protection of surface and groundwater quality both from an environmental perspective as well as public health perspective.

4.10.2.1 Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the United States Environmental Protection Agency (U.S. EPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation’s waters by implementing water quality regulations. As described in Section 4.7.2.1 of this EIR, Section 402(p) of the CWA regulates discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) Program. In addition to their responsibility to issue and enforce compliance with NPDES permits, the RWQCBs are responsible for preparation and revision of the relevant regional Water Quality Control Plan, also known as the Basin Plan (discussed further under local regulations).

Section 303(d) of the CWA requires that each State identify water bodies or segments of water bodies that are “impaired” (i.e., do not meet one or more of the water quality standards established by the State, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology). Inclusion of a water body on the Section 303(d) List of Impaired Water Bodies triggers development of a Total Maximum Daily Load (TMDL) for that water body and a plan to control the associated pollutant/stressor on the list. The TMDL is the maximum amount of a pollutant/stressor that a water body can assimilate and still meet the water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. Table 4.10-2 lists the impaired water bodies in the Master Plan area, including the pollutants that cause the impairments, and the potential sources of the pollutants.

Federal Antidegradation Policy

The federal Antidegradation Policy, established in 1968 under Section 303 of the Clean Water Act, is designed to protect existing uses and water quality and national water resources. Implementation of antidegradation by the States is based on a set of procedures to be followed when evaluating activities that may impact the quality of the waters of the U.S. Antidegradation implementation is an integral component of a comprehensive approach to protecting and enhancing water quality of both surface water and groundwater.
# TABLE 4.10-2

## 303(D) LIST OF IMPAIRED WATER BODIES IN THE WPCP VICINITY

<table>
<thead>
<tr>
<th>Impaired Water Bodies</th>
<th>Pollutants</th>
<th>Potential Source Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco Bay, Lower (Oakland Airport to Dumbarton Bridge)</td>
<td>Chlordane, DDT (Dichlorodiphenyltrichloroethane), Dieldrin</td>
<td>Pesticides</td>
</tr>
<tr>
<td></td>
<td>Dioxin compounds (including 2,3,7,8-TCDD), Furan Compounds, PCBs (Polychlorinated biphenyls), PCBs (Polychlorinated biphenyls) (dioxin-like)</td>
<td>Other organics</td>
</tr>
<tr>
<td></td>
<td>Invasive Species</td>
<td>Miscellaneous</td>
</tr>
<tr>
<td></td>
<td>Mercury</td>
<td>Metals/metalloids</td>
</tr>
<tr>
<td></td>
<td>Trash</td>
<td>Trash</td>
</tr>
<tr>
<td>San Francisco Bay, South (South of Dumbarton Bridge)</td>
<td>Chlordane, DDT (Dichlorodiphenyltrichloroethane), Dieldrin</td>
<td>Pesticides</td>
</tr>
<tr>
<td></td>
<td>Dioxin compounds (including 2,3,7,8-TCDD), Furan Compounds, PCBs (Polychlorinated biphenyls), PCBs (Polychlorinated biphenyls) (dioxin-like)</td>
<td>Other organics</td>
</tr>
<tr>
<td></td>
<td>Invasive Species</td>
<td>Miscellaneous</td>
</tr>
<tr>
<td></td>
<td>Mercury</td>
<td>Metals/metalloids</td>
</tr>
<tr>
<td></td>
<td>Selenium</td>
<td></td>
</tr>
</tbody>
</table>


The federal policy directs states to adopt a statewide policy that includes the following primary provisions applicable to the discharge from the WPCP:

- Existing instream uses and the water quality necessary to protect those uses shall be maintained and protected.
- Where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the State finds that allowing lower water quality is necessary for important local economic or social development.
- Where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

**Safe Drinking Water Act**

Pursuant to the federal Safe Drinking Water Act, the U.S. EPA sets national standards for drinking water to protect public health. Originally, the Safe Drinking Water Act focused primarily on treatment as the means of providing safe drinking water at the tap. The 1996 Safe Drinking Water Act amendments greatly enhanced the existing law by recognizing source water protection, operator training, funding for water system improvements, and public information as important components of safe drinking water.
U.S. EPA Rule for Disinfection Byproducts

Disinfection byproducts are formed when disinfectants used in water and wastewater treatment plants react with bromide and/or natural organic matter (i.e., decaying vegetation) present in the source water. Different disinfectants produce different types or amounts of disinfection byproducts. Disinfection byproducts for which regulations have been established for drinking water include trihalomethanes, haloacetic acids, bromate, and chlorite (U.S. EPA, 2015). The Water Purification Facilities would produce water that may be used for percolation or injection to municipal groundwater supplies and may utilize disinfection processes other than ultraviolet treatment. Therefore, the system used for production and distribution of purified water by the City/District would be subject to the regulations governing disinfection byproducts for drinking water. U.S. EPA has published the Stage 1 Disinfectant and Disinfection Byproducts Rule (Stage 1 Rule; 2010) to regulate disinfection byproducts and set maximum allowable annual average levels for all surface water and groundwater systems (Table 4.10-3).

### TABLE 4.10-3
FEDERAL REGULATION OF DISINFECTION BYPRODUCTS

<table>
<thead>
<tr>
<th>Disinfection Byproduct</th>
<th>Description of the Disinfection Byproduct</th>
<th>Maximum Allowable Annual Average Level under U.S. EPA’s Stage 1 Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trihalomethanes (THM)</td>
<td>A group of four chemicals that are formed along with other disinfection byproducts when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. Examples: chloroform, bromodichloromethane, dibromochloromethane, and bromoform</td>
<td>80 parts per billion (annual average)</td>
</tr>
<tr>
<td>Haloacetic Acids (HAA5)</td>
<td>A group of chemicals that are formed along with other disinfection byproducts when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. Examples: Monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid</td>
<td>60 parts per billion (annual average)</td>
</tr>
<tr>
<td>Bromate</td>
<td>A chemical formed when ozone used to disinfect drinking water reacts with naturally occurring bromide found in source water.</td>
<td>10 parts per billion (annual average)</td>
</tr>
<tr>
<td>Chlorite</td>
<td>A chemical formed when chlorine dioxide is used to disinfect water.</td>
<td>1 part per million (monthly average)</td>
</tr>
</tbody>
</table>


On January 4, 2006, the U.S. EPA promulgated the Stage 2 Disinfectants and Disinfection Byproducts Rule, as required by the Safe Drinking Water Act Amendments of 1996, which provides increased public health protection by reducing the potential risk of adverse health effects associated with Total Trihalomethanes (TTHM) and five Haloacetic Acids (HAA5) throughout the distribution system. U.S. EPA’s Rule applies to community water systems and nontransient noncommunity water systems using a primary or residual disinfectant other than
ultraviolet light or delivering water that has been treated with a primary or residual disinfectant other than ultraviolet light.

**Underground Injection Control Program**

The Underground Injection Control Program is responsible for regulating the construction, operation, permitting, and closure of injection wells that place fluids underground for storage or disposal. Artificial aquifer recharge (AR) is the enhancement of natural groundwater supplies using man-made conveyances such as infiltration basins or injection wells. Aquifer storage and recovery (ASR) is a specific type of AR practiced with the purpose of both augmenting groundwater resources and recovering the water in the future for various uses (U.S. EPA, 2012). The Underground Injection Control program regulates these injection activities to protect underground sources of drinking water.

ASR wells are regulated as Class V injection wells. As such, ASR well owners and operators are required to submit basic inventory information to the primacy enforcement agency. The U.S. EPA may directly implement a program, or a state may have primary enforcement authority, or "primacy". If the owner or operator submits the inventory information and operates the well in a manner that does not endanger an underground source of drinking water, the well is typically authorized by rule. However, a primacy state or U.S. EPA, in the case of a state without primacy, such as California, may require a permit for a Class V well (U.S. EPA, 2012). Specifically, U.S. EPA regulations provide that “no owner or operator shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of the contaminant may cause a violation of any primary drinking water regulation under 40 Code of Federal Regulations Part (CFR) 142 or may otherwise adversely affect the health of persons” ¹ (U.S. EPA, 2012). Refer to the following section for State level requirements for ASR wells that are regulated under the Porter-Cologne Water Quality Control Act.

### 4.10.2.2 State Regulations

**Porter-Cologne Water Quality Control Act**

As described in greater detail in Section 4.7.2.2, the State of California’s Porter-Cologne Water Quality Control Act provides the basis for water quality regulation within California and assigns primary responsibility for the protection and enhancement of water quality to the State Water Resources Control Board (SWRCB) and the nine RWQCBs. Under the Porter-Cologne Act, the SWRCB and RWQCBs also have the responsibility of granting CWA National Pollutant Discharge Elimination System (NPDES) permits and Waste Discharge Requirements (WDRs) for certain point-source and non-point discharges to waters. The Porter-Cologne Act allows the California SWRCB to adopt statewide Water Quality Control Plans and Basin Water Quality Control Plans, which serve as the legal, technical, and programmatic basis of water quality regulation statewide or for a particular region. The water quality control plans limit impacts on

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¹ 40 Code of Federal Regulations Section 144.12.
water quality from a variety of sources. The Basin Plan for the San Francisco Bay and the relevant permits are described below in this section.

**California Toxics Rule**

Under the California Toxics Rule, the U.S. EPA adopted water quality criteria for priority toxic pollutants for inland surface waters, enclosed bays, and estuaries in California. These federally promulgated criteria create water quality standards for California waters. The California Toxics Rule satisfies CWA requirements and is geared toward protection of water quality. The U.S. EPA and the SWRCB have the authority to enforce these standards, which are incorporated into the NPDES permits (discussed in the local regulatory section below) that regulate existing discharges in the Master Plan area.

**California State Antidegradation Policy**

The State Antidegradation Policy, formally known as the “Statement of Policy with Respect to Maintaining High Quality Water in California” (SWRCB Resolution No. 68-16), requires the continued maintenance of existing high quality waters. The policy provides conditions under which a change in water quality is allowable. A change must:

- Be consistent with maximum benefit to the people of the state;
- Not unreasonably affect present and anticipated beneficial uses of water; and
- Not result in water quality less than that prescribed in water quality control plans or policies.

Any actions that can adversely affect surface waters are also subject to the federal Antidegradation Policy (40 CFR § 131.12) developed under the CWA. Discharges from the WPCP that could affect surface water and groundwater quality would be required to comply with the Antidegradation Policy, which is included as part of the NPDES permit requirements for point source discharges (the NPDES permits for the WPCP are discussed below under Water Quality Requirements and Permits – San Francisco Bay Region). This policy would also apply to the discharge related to the WPCP improvements and increased recycled water production at the WPCP under the Master Plan. This policy would also apply to groundwater replenishment activities using purified water from the Water Purification Facilities.

**Drinking Water Regulations**

In California, until recently, the U.S. EPA delegated the enforcement of national drinking water standards to the California Department of Public Health (CDPH). California’s Safe Drinking Water Act authorizes CDPH to promulgate regulations relating to drinking water quality and the operation of public water systems that are a part of Title 22 of the California Code of Regulations (CCR). However, as of July 1, 2014, the administration of the state Drinking Water Program has transferred from CDPH to the Division of Drinking Water (DDW) at the SWRCB. This transfer of responsibility aligns the state’s drinking water and water quality programs in an integrated organizational structure to best position the State to both effectively protect water quality and
public health as it relates to water quality, while meeting current needs and future demands on water supplies (SWRCB, 2014).

Current drinking water regulations include both primary and secondary standards. The primary standards define maximum concentration levels (MCLs) that cannot be exceeded by any public water system. All standards except turbidity are applicable at the point of delivery. Compliance with primary standards is mandatory, because these standards are based on potential health effects on water users. Secondary standards are parameters that may adversely affect the aesthetic quality of drinking water, such as taste and odor; these standards are not federally enforceable, although the State reserves the right to enforce the standards as warranted.

**State Rule on Disinfection Byproducts**

The proposed Water Purification Facilities could include disinfection processes other than ultraviolet treatment and produce high-quality water that would be used for drinking purposes. Therefore the production and distribution system for the water would be subject to the State regulations governing disinfection byproducts (see Section 4.10.2.1 for the federal regulations). California has been granted primary enforcement responsibility, (“primacy”) by U.S. EPA for public water systems in California. California has no authority to enforce federal regulations, only state regulations. Federal law and regulations require that California, in order to receive and maintain primacy, promulgate regulations that are no less stringent than the federal regulations (CDPH, 2012).

As of 2012, CDPH issued new regulations under DPH-09-004 Disinfectant Residuals, Disinfection Byproducts and Disinfection Byproduct Precursors, which builds on the U.S. EPA’s Stage 1 Disinfectants and Disinfection Byproducts Rule by focusing on monitoring for and reducing concentrations of TTHM and HAA5 in drinking water. The Stage 2 Rule requires some systems to complete an Initial Distribution System Evaluation (IDSE) to characterize TTHM and HAA5 levels in their distribution system and identify locations to monitor TTHM and HAA5 for S2DBBPR compliance. The Stage 2 Rule base TTHM and HAA5 compliance on a locational running annual average (LRAA) calculated at each monitoring location (CDPH, 2012).

Some of the requirements of CDPH (2012) that may apply to the Water Purification Facilities are as follows:

- Community water systems, and nontransient noncommunity water systems serving at least 10,000 persons, using a primary or residual disinfectant other than ultraviolet light or delivering water that has been treated with a primary or residual disinfectant other than ultraviolet light would be required to:
  - Conduct an IDSE to characterize locations with high TTHM and HAA5 concentrations.
  - Report TTHM and HAA5 results with respect to revised detection limits for purposes of reporting.
  - Comply with new routine, reduced, and increased monitoring requirements for TTHM and HAA5 and their MCLs on a LRAA basis at each monitoring location.
4. Environmental Setting, Impacts, and Mitigation Measures

4.10 Water Quality

- Conduct an operational evaluation and submit a report to CDPH if the operational evaluation level for TTHM or HAA5 is exceeded.
- Update and submit to CDPH monitoring plans to specify TTHM and HAA5 monitoring locations, where maximum concentration limit (MCL) compliance is determined on a LRAA basis at each monitoring location.
- If using chlorine or chloramines as a disinfectant: comply with additional criteria to resume routine TTHM and HAA5 monitoring (compliance on a system-wide basis).
- If using chlorine dioxide as a disinfectant: Report chlorite results with respect to a revised detection limit for purposes of reporting and comply with sampling requirements at the entrance to and in the distribution system, notification requirements of the water system, and reporting requirements.
- If using ozone as a disinfectant: Report bromate results with respect to a revised detection limit for purposes of reporting and comply with new criteria to reduce or remain on reduced bromate monitoring.
  - Notify CDPH if going on reduced bromate monitoring or resuming routine bromate monitoring and comply with criteria.

If purified water is discharged to a Water of the U.S. that is designated as a drinking water supply, California Toxics Rule criteria for disinfection byproducts will apply to the discharge. The California Toxics Rule criteria for dichlorobromomethane, chlorodibromomethane, bromoform, and chloroform are lower than the maximum allowable level specified in the U.S. EPA drinking water regulations.

**SWRCB Order for ASR**

As discussed under the federal Underground Injection Control program above, the State of California has specific requirements for ASR projects. With the growing limitations on exporting surface water from the Sacramento-San Joaquin Delta and the potential impacts of climate change, the coordinated and planned management of surface water and groundwater resources (called conjunctive use) will become increasingly important in meeting the state's water needs (SWRCB, 2013a). SWRCB identifies ASR as a common conjunctive use strategy. ASR is the enhancement of natural groundwater supplies from sources such as rivers and streams. The purpose of ASR is to augment groundwater resources for future recovery (SWRCB, 2013a).

The SWRCB (2012) adopted Water Quality Order 2012-0010 for ASR projects that inject treated drinking water into aquifers. The general WDRs require that water injected into an aquifer meet drinking water standards and not cause groundwater to violate any water quality objectives in the applicable Basin Plan. The general WDRs are available for use by the RWQCBs for permitting ASR projects that meet the criteria provided in the WDRs (SWRCB, 2013a). Refer to the following subsections for the more specific State and RWQCB water quality requirements that the City/District would be subject to for groundwater replenishment using advanced treated recycled water.
California Code of Regulations - Water Recycling

Section 13550 of the California Water Code states that the use of potable domestic water for nonpotable uses, including, but not limited to, cemeteries, golf courses, parks, highway landscape areas, and industrial and irrigation uses is a waste and unreasonable use of water, if recycled water is available that meets specified conditions of its use. SWRCB supports the use of recycled water and has included increased water recycling in its strategic plan. In 1991, the California Water Recycling Act (California Water Code 13577) set water recycling goals of 700,000 acre-feet per year (AFY) by year 2000 and 1 million AFY by 2010.

DDW is responsible for developing criteria for regulating the use of recycled water in California. The RWQCBs promulgate requirements for individual projects in conformance with the DDW regulations. Title 17 of the CCR states “that the water supplier will protect the public water supply from contamination by implementation of cross connection control program.” Sections 7601-7605 describe the measures required to prevent contamination of potable water from recycled water.

Title 22 of the CCR establishes regulatory requirements to protect public health and the beneficial uses of surface and groundwater from land application and/or industrial use of recycled water. According to Title 22, recycled water can be used for irrigation, restricted and non-restricted recreational impoundments, landscape impoundments, industrial or commercial cooling or air conditioning, toilet flushing and industrial and construction applications. Article 1 in Title 22 of the CCR sets recycled water quality and treatment process criteria for recycled water. Table 4.10-4 summarizes the recycled water quality criteria set by Title 22 for agricultural and urban uses of recycled water. The table is organized with the highest level of treatment at the top and the lowest level of treatment at the bottom.

If the WPF is constructed, recycled water will be treated at an advanced level, achieving a higher quality than specified by disinfected tertiary recycled water criteria. Treatment to tertiary standards can be achieved using a variety of filtration and disinfection methods that are both reliable and relatively common to the wastewater treatment industry.

State Recycled Water Policy

California Water Code Section 13140 authorizes the SWRCB to adopt state policy for water quality control. The SWRCB approved a Recycled Water Policy in February 2009, which was revised in January 2013. The purpose of the Policy is to focus on increasing the use of recycled water from municipal wastewater sources that meets the definition in Water Code Section 13050(n), in a manner that implements state and federal water quality laws. The Policy also describes criteria that are intended to streamline the permitting of recycled water projects.

When used in compliance with this Policy, Title 22 and all applicable state and federal water quality laws, the SWRCB finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses. The SWRCB expects to develop additional policies to encourage the use of stormwater, encourage water conservation, encourage the conjunctive use of surface and groundwater, and improve the use of local water supplies.
### TABLE 4.10-4
SUMMARY OF TITLE 22 STANDARDS AND USES OF RECYCLED WATER

<table>
<thead>
<tr>
<th>Treatment Standard</th>
<th>Water Quality</th>
<th>Use</th>
</tr>
</thead>
</table>
| Disinfected tertiary recycled water | • The filtered wastewater that has been disinfected by either:  
  − A chlorine disinfection process following filtration that provides a contact time (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or  
  − A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.  
  • The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed [a most probable number (MPN)] of 2.2 per 100 milliliters (ml) utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 ml in more than one sample in any 30-day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 ml. | • Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop  
  • Parks and playgrounds  
  • School yards  
  • Residential landscaping  
  • Unrestricted access golf courses  
  • Any other irrigation not prohibited by other sections of the CCR |
| Disinfected secondary-2.2 recycled water | Recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed an MPN of 2.2 per 100 ml utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 ml in more than one sample in any 30-day period | • Food crops where the edible portion is produced above ground and not contacted by the recycled water |
| Disinfected secondary-23 recycled water | Recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed an MPN of 23 per 100 ml utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 ml in more than one sample in any 30-day period | • Cemeteries  
  • Freeway landscaping  
  • Restricted access golf courses  
  • Ornamental nursery stock and sod farms where access by the general public is not restricted  
  • Pasture for animals producing milk for human consumption |
4. Environmental Setting, Impacts, and Mitigation Measures
4.10 Water Quality

### TABLE 4.10-4 (Continued)
SUMMARY OF TITLE 22 STANDARDS AND USES OF RECYCLED WATER

<table>
<thead>
<tr>
<th>Treatment Standard</th>
<th>Water Quality</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undisinfected secondary recycled water</td>
<td>Wastewater in which the organic matter has been stabilized, is non-putrescible, and contains oxygen.</td>
<td>• Any non-edible vegetation where access is controlled so that the irrigated area cannot be used as if it were part of a park, playground, or school yard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Orchards where the recycled water does not come into contact with the edible portion of the crop</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Vineyards where the recycled water does not come into contact with the edible portion of the crop</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Non-food-bearing trees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fodder and fiber crops and pasture for animals not producing milk for human consumption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Seed crops not eaten by humans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Food crops that must undergo commercial pathogen-destroying processing before being consumed by humans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ornamental nursery stock and sod farms provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting, retail sale, or allowing access by the general public</td>
</tr>
</tbody>
</table>

SOURCE: Title 22, California Code of Regulations

Because the WPF would provide advanced treated high-quality recycled water for groundwater replenishment, it would be subject to any groundwater management plans in the Master Plan area that are required under the State Recycled Water Policy. The revised (2013) Policy also includes monitoring strategies and requirements for contaminants or chemicals of emerging concern and includes provisions (parallel to the State Antidegradation Policy) for requiring groundwater assessments associated with groundwater replenishment (GWR) projects (discussed below).

### Salt and Nutrient Management Plan

Some groundwater basins in the state contain salts and nutrients that exceed or threaten to exceed water quality objectives established in the applicable Basin Plans, and not all Basin Plans include adequate implementation procedures for achieving or ensuring compliance with the water quality objectives for salt or nutrients. These conditions can be caused by natural factors.

2 There are regional hydrological basin plans and the one for San Francisco Bay region is discussed below in the next subsection.
soils/conditions, discharges of waste, irrigation using surface water, groundwater or recycled water and water supply augmentation using surface or recycled water. The intent of the Recycled Water Policy is to manage salts and nutrients from all sources on a basin-wide or watershed-wide basis in a manner that ensures attainment of water quality objectives and protection of beneficial uses. The SWRCB finds that the appropriate way to address salt and nutrient issues is through the development of regional or subregional salt and nutrient management plans rather than through imposing requirements solely on individual recycled water projects (SWRCB, 2013b).

To achieve its mission to “preserve, enhance and restore the quality of California’s water resources to the benefit of present and future generations”, the SWRCB supports and encourages every region in California to develop a salt/nutrient management plan by 2014 that is sustainable on a long-term basis and that provides California with clean, abundant water (SWRCB, 2013b). The Recycled Water Policy requires that Salt and Nutrient Management Plans be completed within 5 years of policy adoption (or 7 years if substantial progress can be demonstrated) to facilitate basin-wide management of salts and nutrients from all sources in a manner that optimizes recycled water use while ensuring protection of groundwater supply and beneficial uses, agricultural beneficial uses, and human health. The Recycled Water Policy requires stakeholders to develop implementation plans to meet these objectives for salts and nutrients. The implementation plans will then be adopted by RWQCBs as amendments to the region’s Basin Plan.

A salt and nutrient management plan is required to be developed for every groundwater basin or sub-basin by May 2016. The plan must include implementation measures to manage salt and nutrient loadings in the basin on a sustainable basis. As previously discussed, the District prepared the SNMP for the Santa Clara Groundwater Subbasin in 2014.

**Contaminants of Emerging Concern**

New and emerging contaminants are unregulated and may be new contaminants (e.g., methyl-tert-butyl ether or MTBE, now regulated in California) or those that may have been present but not previously detected (e.g., perchlorate, now also regulated in California), or not yet identified as a public health concern. Other examples of such contaminants are 1,2,3-trichloropropane, n-nitrosodimethylamine (NDMA) and other nitrosamines and 1,4-dioxane. Also among the emerging contaminants are pharmaceuticals and personal care products, industrial chemicals present at low concentrations, and chemicals that may affect hormone status, referred to as "endocrine disruptors". Contaminants of emerging concern are potentially present in recycled water, but the detection of many of these chemicals is so recent that robust methods for their quantification and toxicological data for interpreting potential human or ecosystem health effects are unavailable.

According to the Recycled Water Policy, regulation of contaminants of emerging concern as part of regulatory requirements for recycled water shall be based on the best available peer-reviewed science. A scientific advisory panel was formed to provide guidance for developing monitoring programs that assess potential contaminants of emerging concern (CEC) threats from various water recycling practices, including indirect potable reuse via surface spreading; indirect potable reuse via subsurface injection into a drinking water aquifer; and urban landscape irrigation. In its
4. Environmental Setting, Impacts, and Mitigation Measures

4.10 Water Quality

(Anderson et al., 2010), the panel recommended monitoring a specific list of selected health-based and treatment performance indicator contaminants of emerging concern. Use of recycled water by the District for groundwater replenishment would, by regulation, include monitoring for contaminants of emerging concern in accordance with plans approved by the RWQCB and DDW.

Provisions with Antidegradation Policy

The San Francisco Bay RWQCB has the discretionary authority to allocate assimilative capacity to GWR projects. Assimilative capacity is the capacity of the groundwater to receive toxic materials without detrimental effects to human health from consuming the water. The City/District would be required to conduct an antidegradation analysis verifying the use of the assimilative capacity prior to startup of the WPF. Relevant provisions of the Basin Plan that implement the Antidegradation Policy and the Recycled Water Policy are listed below.

- Groundwater assessments of the impacts of the projects on areas of contamination in a basin and/or if the quality of the water used for replenishment causes constituents, such as naturally occurring arsenic, to become mobile and impact groundwater.
- Conduct an antidegradation analysis verifying the use of assimilative capacity.

Criteria for Using Recycled Water for Surface Water Augmentation and Groundwater Replenishment

The City of San José and the District (2014) prepared a Strategic and Master Plan – the South Bay Water Recycling (SBWR) Plan – to evaluate recycled water produced from the San José/Santa Clara Regional Wastewater Facility. The SBWR Plan has a 20-year planning horizon and identifies the purpose and future of recycled water produced from the facility at the San José /Santa Clara Regional Wastewater Facility in terms of meeting the regulatory needs as well as contributing to regional water supplies. The SBWR Plan identified indirect potable reuse (IPR) of advanced treated or high-quality recycled water as one of the recycled water use options (SCVWD and City of San José, 2014). Under the SBWR Plan, the high-quality recycled water is introduced into an environmental buffer such as a groundwater aquifer or surface water reservoir, for a specific period of time before being withdrawn for potable use. Indirect potable reuse (IPR) has been implemented in California. The treatment technologies employed under IPR have been accepted by various regulatory authorities as being able to reliably produce safe drinking water, and the implementation of these projects has been accepted by the public (WateReuse Research Foundation, 2014).

The use of recycled water (for potable or non-potable uses) is regulated under the Clean Water Act when applicable as a discharge to the waters of the U.S. Introduction of the purified or high-quality recycled water into surface water such as streams or creeks, reservoirs or percolation ponds are subject to water quality standards specified under the California Toxics Rule and CCR Title 22 as discussed above. A NPDES permit, WDRs, or Water Recycling Requirements will be adopted to manage the impacts of these projects as discussed below.
Under both surface water augmentation and GWR options, the recycled water would be subject to the California Water Code (CWC) and Health and Safety Code (H&SC) sections that regulate the use of water and the protection of water quality, public health, water recycling, and water rights. See the discussion above under the State regulations for recycled water and protection of water quality and public health.

**Groundwater Replenishment**

The CWC sections 13500-13529.4 and H&SC 116800 et seq. require DDW to establish uniform statewide recycling criteria. DDW has developed these criteria for non-potable reuse and GWR and they are codified in CCR Title 22.

Prior to June 18, 2014, the Water Recycling Criteria (CCR Title 22) included narrative requirements for planned groundwater replenishment projects. The regulations required that recycled water must be at all times of a quality that fully protects public health and required that DDW make recommendations on an individual case basis, taking into consideration all relevant aspects of each project, including the following factors: treatment provided; effluent quality and quantity; spreading area operations; soil characteristics; hydrogeology; residence time; and distance to withdrawal.

GWR regulations were adopted on June 18, 2014 that specifically apply to indirect potable reuse projects (Title 22 Division 4 Chapter 3 Article 5.1 Indirect Potable Reuse: Groundwater Replenishment – Surface Application and Article 5.2 Indirect Potable Reuse: Groundwater Replenishment – Subsurface Application, Sections 60320.100 through 60320.228). These articles identify requirements that apply to IPR projects utilizing surface application (Article 5.1) and subsurface application (Article 5.2). Requirements include monitoring, groundwater modeling to determine underground retention time, preparation of operations plans and emergency response plans, treatment process criteria, contaminant control, diluent water contributions, and public hearings. Table 4.10-5 below summarizes key aspects of the requirements of these regulations. Fulfillment of these requirements is accomplished through DDW review and approval of an Engineering Report and by issuance of Water Recycling Requirements by the RWQCB for a given project.

Table 4.10-5 summarizes the requirements for GWR projects that utilize recycled water, such as the WPF, to protect groundwater that is used as a municipal drinking water supply.

Other requirements include:

- Adequate managerial and technical capability: Demonstrate possession of adequate managerial and technical capability to comply with the regulations.
- Emergency Response Plan: Develop and implement a DDW-approved plan for an alternative source of potable water supply or treatment at a drinking water well if a GWR project cause the well to no longer be safe for drinking purposes.
- Monitoring Program: Develop and implement a comprehensive monitoring program for recycled water, dilution water, and groundwater for regulated and unregulated constituents.
### TABLE 4.10-5
SUMMARY OF REQUIREMENTS FOR GROUNDWATER REPLENISHMENT PROJECTS USING RECYCLED WATER

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Mechanism or Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source Control</td>
<td>Comprehensive source control program as a critical first barrier to prevent undesirable chemicals from entering wastewater.</td>
</tr>
<tr>
<td>Pathogen Control</td>
<td>Treatment of recycled water similar to the approach used for drinking water regulations by establishing log reductions for the treatment process to meet the low tolerable risk level.</td>
</tr>
<tr>
<td>Nitrogen Control</td>
<td>To ensure protection of groundwater, the concentration of total nitrogen in recycled water must meet 10 milligrams per liter before or after recharge.</td>
</tr>
<tr>
<td>Regulated Chemicals Control</td>
<td>The recycled water must meet drinking water MCLs as specified by the regulations.</td>
</tr>
<tr>
<td>Unregulated Chemicals Control</td>
<td>CEC monitoring.</td>
</tr>
<tr>
<td>Response Retention Time (RRT)</td>
<td>To retain recycled water underground to provide time to identify any treatment failure so that inadequately treated recycled water does not enter a potable water system.</td>
</tr>
<tr>
<td>Boundaries restricting production wells</td>
<td>A “zone of restricted well construction” that represents the highest of the horizontal and vertical distances to a drinking water production well and reflects the underground retention times required for pathogen control or for RRT.</td>
</tr>
<tr>
<td>Unregulated Chemicals Control</td>
<td>Monitoring the concentrations and toxicities of thousands of potential organic compounds in a recycled water would be an infeasible task. Control of unregulated chemicals for all GWR projects is accomplished through the application of an allowable Recycled Water Contribution (RWC) and recycled water limits for Total Organic Carbon (TOC). For surface application GWR projects, additional Soil Aquifer Treatment Process (SAT) performance requirements apply (for removal of TOC and constituents of emerging concern). For subsurface application projects, the recycled water must receive advanced treatment using reverse osmosis (RO) and advanced oxidation (AOP) and the regulations includes specific performance criteria for RO and AOP. TOC is used as a surrogate for unregulated and unknown organic chemicals. Failure to meet the requirements established for a GWR project results in taking corrective actions, consultation with regulators, and in some cases cessation of the use of recycled water. For surface spreading projects, the recycled water TOC must be less than 0.5 mg/L divided by the RWC, which is the ratio of recycled water applied for replenishment divided by the sum of recycled water and any applied credited dilution water that meets specific water quality requirements. This approach allows a GWR project to balance treatment and dilution as necessary to comply with requirements. Surface spreading projects can use disinfected tertiary recycled water, but require dilution water to go above RWCs typically &gt; 50% based on TOC. If advanced treatment is used, surface spreading projects may not require dilution water. For subsurface application projects, the TOC must be less than 0.5 mg/L and projects have the ability to begin using 100% recycled water.</td>
</tr>
</tbody>
</table>
• Operation and Optimization Plan: Develop plan to assure that the treatment, distribution, and replenishment facilities are operated to achieve compliance with the GWR regulations, to achieve optimal reduction of contaminants, and to identify how the project will be operated and monitored.

• Reporting:
  − Submit an Engineering Report to DDW and RWQCB that indicates how the project will comply with all the regulations and include a contingency plan to ensure that no untreated or inadequately treated water will be used.
  − Hold a public hearing to inform DDW approval of the Engineering Report.
  − Submit annual reports to DDW and RWQCB.

The technical report by Anderson et al. (2010) that developed recycled water CEC monitoring criteria recommends monitoring of surrogate chemical constituents for GWR projects. Specifically, the monitoring recommendations for GWR projects address surface spreading using tertiary recycled and injection projects using advanced treated recycled water.

SWRCB acknowledges that all GWR projects using recycled water must be reviewed and permitted on a site-specific basis, and such projects will require project-by-project review. The Recycled Water Policy lists the following criteria that will be met by approved GWR projects:

(1) Compliance with regulations adopted by CDPH for GWR projects or, in the interim until such regulations are approved, CDPH’s recommendations pursuant to Water Code section 13523 for the project (e.g., level of treatment, retention time, setback distance, source control, monitoring program, etc.).

(2) Implementation of a monitoring program for contaminants of emerging concern that is consistent with the Recycled Water Policy and any recommendations from CDPH. GWR projects shall include monitoring of recycled water for priority pollutants twice per year.

San Francisco Bay Water Quality Control Plan (Basin Plan)

The Water Quality Control Plan for the San Francisco Bay Basin of California (or Basin Plan) establishes water quality objectives and beneficial uses for waters in the San Francisco Bay basin. The San Francisco RWQCB implements the Basin Plan. The Basin Plan (2013) designates beneficial uses and water quality objectives for “waters of the State,” including surface waters and groundwater, and includes programs of implementation to achieve the water quality objectives. Table 4.10-6 lists the beneficial uses that the Basin Plan has identified for the water bodies relevant to the Master Plan.

Although South San Francisco Bay is listed to support shellfish harvesting, according to a City of San José report, representatives from the California Department of Fish and Game have stated that no shellfish harvesting occurs in San Francisco Bay south of Foster City. In addition, the beneficial use of shellfish harvesting (see Table 4.10-6) likely does not exist in Moffett Channel or

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4 Now California Department of Fish and Wildlife
Guadalupe Slough. Both water bodies are characterized with soft mudflats and subtidal marsh, which are not suitable shellfish habitats. The City’s 2004 beneficial use survey of Moffett Channel and Guadalupe Slough found no attempts by the public at shellfish harvesting over a period of 18 months (RWQCB, 2009).

The Santa Clara Valley groundwater basin underlying the Master Plan area is designated for the following existing beneficial uses: municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply (RWQCB, 2013).

Surface water bodies in the Master Plan area and groundwater recharge areas designated with “groundwater recharge or GWR” as a beneficial use include Los Gatos Creek. The Basin Plan (RWQCB, 2013) defines this beneficial use as “use of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting saltwater intrusion into freshwater aquifers.” The requirements for GWR operations (as proposed for the WPF) generally reflect the future use to be made of the water stored underground. In some cases, recharge operations may be conducted to prevent seawater intrusion. In these cases, the quality of recharged waters may not directly affect quality at the well field being protected. Recharge operations are often limited by excessive suspended sediment or turbidity that can clog the surface of recharge pits, basins, or wells (RWQCB, 2013).

Under the state Antidegradation Policy, the quality of some of the waters of the state is higher than established by adopted policies. It is the intent of this policy to maintain that existing higher water quality to the maximum extent possible. Requirements for GWR, therefore, shall impose the Best Available Technology (BAT) or Best Management Practices (BMPs) for control of the discharge as necessary to assure the highest quality consistent with maximum benefit to the people of the state (RWQCB, 2013).

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**TABLE 4.10-6**

**BENEFICIAL USES OF SOUTHERN SAN FRANCISCO BAY AND APPLICABLE TRIBUTARIES**

<table>
<thead>
<tr>
<th>Water Body</th>
<th>Existing Beneficial Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco Bay, South</td>
<td>Industrial Service Supply, Commercial and Sportfishing, Shellfish Harvesting, Estuarine Habitat, Fish Migration, Preservation of Rare and Endangered Species, Fish Spawning, Wildlife Habitat, Water Contact Recreation, Non-Contact Water Recreation</td>
</tr>
<tr>
<td>Guadalupe Slough</td>
<td>Estuarine Habitat, Preservation of Rare and Endangered Species, Wildlife Habitat, Water Contact Recreation, Non-Contact Water Recreation</td>
</tr>
<tr>
<td>Moffett Channel</td>
<td>Estuarine Habitat, Wildlife Habitat, Water Contact Recreation, Non-Contact Water Recreation</td>
</tr>
<tr>
<td>Los Gatos Creek*</td>
<td>Municipal and Domestic Supply, Freshwater Replenishment, Groundwater Recharge, Cold Freshwater Habitat, Preservation of Rare and Endangered Species, Warm Freshwater Habitat, Wildlife Habitat, Water Contact Recreation</td>
</tr>
</tbody>
</table>

* Potential beneficial use identified for Los Gatos Creek is Fish Migration, Fish Spawning, and Non-Contact Water Recreation.

The Basin Plan lists the following policies relevant to sources of drinking water and recycled water use applicable to the Master Plan and the WPF:

- **Sources of Drinking Water Policy**: This policy, adopted by the SWRCB in 1988 and incorporated into the Basin Plan in 1989 (Water Board Order No. 89-039), established state policy that all surface and groundwater in the state are considered suitable, or potentially suitable, for municipal or domestic supply (MUN) and should be designated for this use, with certain exceptions.

- **Water Reuse Study – Resolution No. 79-2**: In this resolution, the SWRCB stated its position regarding Phase II of the San Francisco Bay Area Water Reuse Study. The SWRCB acknowledged the importance of using recycled water to meet California’s future water supply needs and commented on the economics of the delivery of recycled water to users.

The Basin Plan includes measures to encourage increased water recycling in Section 4.6.1, *Dilution Ratios*, excerpted below.

For discharges to surface water bodies, the RWQCB will consider inclusion of an effluent limitation greater than that calculated from water quality objectives when,

- The increase in concentration is caused by implementation of significant water reclamation or water reuse programs at the facility;
- The increase in the effluent limitation does not result in an increase in the mass loading; and
- Water quality objectives will not be exceeded outside the zone of initial dilution.

**Water Quality Requirements and Permits – San Francisco Bay Region**

The San Francisco Bay RWQCB regulates discharges of treated wastewater to surface water bodies by issuing NPDES permits and to land (e.g., ponds or irrigation) by issuing WDRs.

The Sunnyvale WPCP is one of several municipal wastewater treatment facilities (excluding wet weather facilities) within the San Francisco Bay Region that discharges directly into surface waters under an individual NPDES permit. Under normal operational conditions, the wastewater treatment facilities provide a minimum of secondary treatment with more than 30 percent of the total flow receiving advanced treatment. In the Lower South Bay, the Sunnyvale WPCP is one of the three municipal dischargers along with the San José/Santa Clara Water Pollution Control Plant and the Palo Alto Regional Water Quality Control Plant. These three plants serve all of the urban communities of Santa Clara County. The Lower South Bay municipal dischargers discharge effluent that receives tertiary treatment (secondary plus nitrification, filtration, and disinfection) to shallow sloughs contiguous with the Bay, south of the Dumbarton Bridge.

The existing discharge locations for the three dischargers in the South Bay region were found to be contrary to Basin Plan policy concerning shallow water discharge prohibitions. The 1990 SWRCB Order WQ 90-5 found that a net environmental benefit exception to these prohibitions could not be made. However, the Order found that a finding of equivalent protection can be made if water quality based concentration limits for metals and revised mass loading limits for
metals are placed in the dischargers’ NPDES permits, if Sunnyvale and San José/Santa Clara continue avian botulism control programs, and if San José/Santa Clara implements mitigation for loss and degradation of endangered species habitat. Order WQ 90-5 also included provisions that would prevent increases in flows that would adversely impact endangered species habitats.

NPDES Permits for the Sunnyvale WPCP

The City of Sunnyvale operates the WPCP under Order No. R2-2014-0035l, (NPDES No. CA0037621) as well as Order No. R2-2014-0014 (Nutrient Watershed Permit, NPDES No. CA0038873) and Order No. R2-2012-0096 (Mercury and PCBs Watershed Permit, NPDES No. CA0038849) issued by the San Francisco Bay RWQCB. The NPDES Permits regulate the discharge of the advanced secondary-treated municipal wastewater at the WPCP into Moffett Channel through a shallow water outfall. The WPCP has permitted average dry weather flow capacity of 29.5 million gallons per day (mgd) and a peak wet weather flow design capacity of 40 mgd. Section 2.1 in Chapter 2, Project Background, describes wastewater treatment processes at the plant.

The permits require that the City maintain compliance with the listed effluent limitations at Discharge Point 001 with compliance measured at “EFF-001” located at any point in the outfall following treatment, including disinfection, and before contact with receiving water, where all waste streams tributary to Discharge Point 001 are present.

The permits list the following discharge prohibitions:

- Discharge of treated wastewater at a location or in a manner different from that described in this Order is prohibited.
- The bypass of untreated or partially treated wastewater to waters of the United States is prohibited, except as provided for in the Order.
- The average dry weather effluent flow as measured at monitoring station EFF-002^5, described in the Order, shall not exceed 29.5 mgd. Actual average dry weather flow shall be determined for compliance with this prohibition over three consecutive dry weather months each year.
- Any sanitary sewer overflow that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited.

The permit includes both technology-based effluent limitations and water quality-based effluent limitations; the former includes conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards and the latter include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

The technology-based effluent limitations consist of restrictions on pH, total suspended solids (TSS), and carbonaceous biochemical oxygen demand (CBOD). Water quality-based effluent limitations have been derived to implement water quality objectives that protect beneficial uses.

^5 At the point after filtration but before chlorination where all effluent flows are present.
The City is required to maintain compliance at ‘Discharge Point 001 with compliance measured at Monitoring Location EFF-001 (see Table 4.10-7).

### TABLE 4.10-7
SUMMARY OF NUMERIC EFFLUENT LIMITATIONS FOR THE WPCP  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Effluent Limitations</th>
<th>Average Monthly</th>
<th>Average Weekly</th>
<th>Maximum Daily</th>
<th>Instantaneous Minimum</th>
<th>Instantaneous Maximum</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBOD</td>
<td>mg/L</td>
<td></td>
<td>10</td>
<td>-</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>Average Monthly Removal ≥ 85%</td>
</tr>
<tr>
<td>TSS</td>
<td>mg/L</td>
<td></td>
<td>20</td>
<td>-</td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>Average Monthly Removal ≥ 85%</td>
</tr>
<tr>
<td>Oil and Grease</td>
<td>mg/L</td>
<td></td>
<td>5</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>standard units</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6.5</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>Total Chlorine Residual</td>
<td>mg/L</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Turbidity</td>
<td>NTU</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Total Ammonia (October-May)</td>
<td>mg/L as nitrogen</td>
<td></td>
<td>18</td>
<td>-</td>
<td>26</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total Ammonia (June-September)</td>
<td>mg/L as nitrogen</td>
<td></td>
<td>2.0</td>
<td>-</td>
<td>5.0</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Enterococcus bacteria</td>
<td>-</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30-day mean not to exceed 35 colonies/100 mL</td>
</tr>
</tbody>
</table>

**Toxic Pollutants**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Average Monthly</th>
<th>Average Weekly</th>
<th>Maximum Daily</th>
<th>Instantaneous Minimum</th>
<th>Instantaneous Maximum</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>μg/L</td>
<td>10</td>
<td>-</td>
<td>19</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel</td>
<td>μg/L</td>
<td>24</td>
<td>-</td>
<td>35</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mercury</td>
<td>μg/L</td>
<td>0.025</td>
<td>0.027</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PCBs</td>
<td>μg/L</td>
<td>0.00039</td>
<td>-</td>
<td>0.00049</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cyanide</td>
<td>μg/L</td>
<td>7.5</td>
<td>-</td>
<td>17</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dioxin-TEQ</td>
<td>μg/L</td>
<td>1.4 × 10^7</td>
<td>-</td>
<td>2.8 × 10^7</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bis (2-Ethylhexyl) Phthalate</td>
<td>μg/L</td>
<td>5.9</td>
<td>-</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**NOTES:**
- CBOD = carbonaceous biochemical oxygen demand
- TSS = total suspended solids
- TEQ = toxic equivalency quantity
- As specified by Order No. R2-2014-0035 (WPCP Operation) and Order No. R2-2012-0096 (Mercury and PCBs Watershed Permit).
- Unit Abbreviations: mg/L = milligrams per liter; μg/L = micrograms per liter; NTU = Nephelometric turbidity units
- Limitations apply to the average concentration of all samples collected during the averaging period (daily ~ 24-hour period; monthly ~ calendar month).

As discussed briefly above, the discharge from the Sunnyvale WPCP through the shallow water outfall does not receive a minimum dilution of 10:1 upon discharge as required by the Basin Plan and thus violates the following Basin Plan discharge prohibition 1: “Any wastewater which has particular characteristics of concern to beneficial uses at any point at which the wastewater does not receive a minimum initial dilution of at least 10:1, or into any nontidal water, deadend slough, similar confined waters, or any immediate tributaries thereof.” The Basin Plan allows exceptions to the violation of the Basin Plan prohibition 1 when there would otherwise be an inordinate burden placed on a discharger (here, the City of Sunnyvale) and an equivalent level of protection is possible through such means as providing a higher level of treatment. The City was granted an exception to Basin Plan Prohibition 1 in the current WPCP NPDES permit based on the following:

- Moving the Discharger’s outfall to deep water (i.e., north of the Dumbarton Bridge) would be an inordinate burden because such relocation requires the pipeline construction through protected wetlands, which is not only costly but also inevitably result disturbance to the wetland habitats.

- The requirements of this Order (i.e., its prohibitions, limitations, and provisions) implement applicable water quality objectives and protect all relevant beneficial uses.

- The Discharger continues to provide an equivalent level of environmental protection by providing advanced secondary treatment through a higher level of CBOD5 and solids removal and nitrification and maintaining its pretreatment and pollution prevention programs.

- To further justify an exception, the Discharger has invested over $20 million to date to pursue wastewater reclamation projects to reduce its discharge volumes. Although the recycled water deliveries have been temporarily suspended for the last few years due to a variety of factors, including rehabilitation projects at the treatment plant, the Discharger continues to maintain the recycled water program, as evidenced by ongoing inspections and cross-connection testing at use sites, among other accomplishments. The Discharger plans to resume recycled water production in summer 2014 (RWQCB, 2014).

The WPCP NPDES permit also notes the City’s maintenance of its avian botulism program since 1982, which includes monitoring of Moffett Channel, Guadalupe Slough, the oxidation ponds, and South San Francisco Bay for the presence of avian botulism.

Waste Discharge Requirements/Water Recycling Requirements

In addition to NPDES permits, the RWQCB issues WDRs or Water Recycling Requirements for some discharges such as recycled water generated at the Sunnyvale WPCP that is used currently for landscape irrigation. Under the Master Plan with or without the WPF, recycled water generation would be expanded and it would be used for increased landscape irrigation and potentially industrial purposes (under the Master Plan) and for surface water augmentation and/or GWR (for the WPF).
RWQCB Order No. 94-069 (Water Reclamation Requirements). Recycled water generated at the WPCP is currently regulated under the RWQCB Order No. 94-069. The City provides recycled water for distribution throughout the northern portion of Sunnyvale, mainly for irrigation purposes and also for construction use at remote locations through a truck fill facility located at the WPCP (RWQCB, 2009).

During periods of recycled water production in high recycled water demand seasons (typically 12-16 hours a day), the treatment process is (e.g., polymer and chlorine doses are) adjusted to meet Title 22 requirements (turbidity needs to be below 2 NTU for the recycled water versus 10 NTU for effluent discharge). The portion of the recycled water diverted to the recycled water pump station is partially dechlorinated using sodium bisulfite. During recycled water production, there is no discharge to Moffett Channel (RWQCB, 2009).

Future Water Reclamation Requirements. Additional non-potable uses of recycled water will likely be approved under the Statewide General WDRs for Recycled Water (Order WQ 2014-0090-DWQ). The SWRCB is planning to reissue the Statewide WDRs as Water Recycling Requirements in February 2016. For potable uses of recycled water (GWR projects), the RWQCB will issue site-specific Water Recycling Requirements.

Basin Plan Objectives for Mercury relative to Oxidation Pond Restoration

The Master Plan would have significant impacts to both the regional setting and the local setting if levee breaching or restoration activities resulted in water quality conditions that exceed the tissue-based mercury water quality objectives in the Basin Plan. In addition, the narrative water quality objective for bioaccumulation is considered to be a threshold for significant impacts:

Many pollutants can accumulate on particles, in sediment, or bioaccumulate in fish and other aquatic organisms. Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered.

San Francisco Bay Conservation and Development Commission and the San Francisco Bay Plan

The San Francisco Bay Plan (Bay Plan) contains the policies that BCDC uses to determine whether permit applications can be approved for projects within the BCDC jurisdiction, which consists of the Bay, salt ponds, managed wetlands, certain waterways and land within 100 feet of the Bay (see Section 4.2.2.2 for additional details about BCDC jurisdiction). The BCDC’s Bay Plan policies related to water quality are listed below.

- Water Quality Policy 2: Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board’s Water Quality Control Plan, San Francisco Bay Basin and should be protected from all harmful or potentially harmful pollutants. The policies, recommendations, decisions, advice and authority of the State Water Resources Control Board and the Regional Board, should be the basis for carrying out the Commission’s water quality responsibilities.
• Water Quality Policy 3: New projects should be sited, designed, constructed and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into the Bay by: (a) controlling pollutant sources at the project site; (b) using construction materials that contain nonpolluting materials; and (c) applying appropriate, accepted and effective best management practices, especially where water dispersion is poor and near shellfish beds and other significant biotic resources.

4.10.2.3 Local Regulations

City of Sunnyvale General Plan

The Sunnyvale General Plan (2011) contains goals, policies, and actions aimed toward wastewater collection and treatment at the WPCP. Table 4.10-8 lists the relevant General Plan goals, policies, and actions.

<table>
<thead>
<tr>
<th>Relevant Goals, Policies and Actions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal EM-5 Minimal Pollution and Quantity of Wastewater. Ensure that the quantity and composition of wastewater generated in the city does not exceed the capabilities of the wastewater collection system or and the WPCP.</td>
<td></td>
</tr>
<tr>
<td>Policy EM-5.1 WPCP Improvements should be designed, constructed, and maintained and the quantity of industrial wastes should be controlled so that the WPCP does not have to be expanded in excess of its capacity of 29.5 mgd.</td>
<td></td>
</tr>
<tr>
<td>Policy EM-5.2 Ensure that wastes discharged to the wastewater collection system can be treated by existing treatment processes of the WPCP.</td>
<td></td>
</tr>
<tr>
<td>Goal EM-6 Effective Wastewater Collection System: Continue to operate and maintain the wastewater collection system so that all sewage and industrial wastes generated within the city are collected and conveyed under safe and sanitary conditions to the WPCP.</td>
<td></td>
</tr>
<tr>
<td>Policy EM-6.1 Inspect critical points in the wastewater management system annually to ensure that the proper level of maintenance is being provided and that the flow in sewers does not exceed design capacity.</td>
<td></td>
</tr>
<tr>
<td>Goal EM-7 Effective Wastewater Treatment. Continue to operate and maintain the WPCP, using cost-effective methods, so that all sewage and industrial wastes generated within the city receive sufficient treatment to meet the effluent discharge and receiving water standards of regulatory agencies.</td>
<td></td>
</tr>
<tr>
<td>Policy EM-7.1 Monitor WPCP operations and maintenance to meet regulatory standards.</td>
<td></td>
</tr>
<tr>
<td>Policy EM-7.2 Coordinate operating procedures within the City Energy Policy to optimize an alternative energy program so that minimum use and reliance are placed on outside energy sources.</td>
<td></td>
</tr>
<tr>
<td>Policy EM-7.3 Actively participate in the watershed management approach to solving water quality issues of the Santa Clara Basin watershed and the South Bay.</td>
<td></td>
</tr>
<tr>
<td>Policy EM-7.4 Produce recycled water and seek to maximize the use of this resource.</td>
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</tr>
</tbody>
</table>
4.10.3 Impacts and Mitigation Measures

4.10.3.1 Thresholds of Significance

For the purposes of this EIR, a water quality impact is considered significant if implementation of the Master Plan or the Master Plan with the WPF would result in any of the following:

- Violate water quality standards or waste discharge requirements.
- Otherwise substantially degrade water quality.

4.10.3.2 Approach to Analysis

The analysis of water quality impacts focuses on the changes in the receiving water quality in South San Francisco Bay and compliance with the applicable regulations associated with the discharge from the WPCP. Each impact is addressed at the program level. Stormwater quality impacts are discussed separately in Section 4.9, Hydrology.

The impact analysis is developed based on the proposed changes to the WPCP operations as part of the Master Plan and how those changes would affect the water quality in receiving waters. The impact discussion uses existing WPCP operations and the existing discharge and receiving water quality conditions as a baseline.

An impact would be considered significant if the Master Plan shows a potential to increase the concentration of a constituent relative to existing conditions resulting in an exceedance of the applicable water quality objectives. The impact analysis is therefore based upon the estimated changes in the water quality (i.e., concentration and mass loading of pollutants of concern) caused by the changes in the waste discharge from the WPCP in the receiving waters under the Master Plan and the WPF. If the concentration of a constituent would not increase (or decrease in the case of dissolved oxygen and pH), or if the resulting concentration of a constituent would not be expected to exceed the applicable water quality objectives, then the impact would be considered less than significant. Therefore, the significance of an impact from the proposed Master Plan improvements and the WPF is assessed by compliance with the effluent water quality limits; cumulative impacts are assessed by the level of mass loading from the effluent considering other sources.

With implementation of the WPF, the District would produce high-quality purified water at the WPCP for indirect potable reuse, using the purified water to replenish the groundwater basin for storage (or recharge or replenishment, referred to as GWR, described above) and later withdrawal and use. The District would implement groundwater replenishment by piping the purified water to existing District recharge basins and new injection wells that would be constructed as part of the WPF groundwater replenishment facilities. The City of Sunnyvale does not have jurisdiction over, and would not be taking a discretionary action on, groundwater replenishment implemented by the District. Because the purified water produced by the WPF would be used for groundwater replenishment, the potential impacts to groundwater quality are discussed here. Hydrological and stormwater impacts including those from construction of such
facilities as well as changes in groundwater hydrology and levels during operation are discussed in Section 4.9, Hydrology. Potential impacts to vegetation communities relating to changes in effluent discharge volumes are discussed in Section 4.7, Biological Resources.

4.10.3.3 Impact Summary

Table 4.10-9 lists the water quality impacts and significance determinations for the Master Plan improvements and the WPF.

4.10.3.4 Master Plan Impacts and Mitigation Measures

Impact WQ-1: The discharge resulting from the Master Plan improvements as part of the proposed Master Plan would comply with the applicable water quality regulations and not violate water quality objectives, a less-than-significant impact.

Implementation of the proposed Master Plan improvements would involve upgrading the existing wastewater treatment facilities to include several additional treatment features to enhance the reliability of the WPCP to provide treatment to wastewater and also comply with existing and future regulations. The detailed improvements are discussed in greater detail in Chapter 3, Project Description, and include, as relevant to water quality, replacement of existing oxidation pond systems by a conventional activated sludge process as part of secondary treatment; potential nitrogen removal facilities and filtration as part of tertiary treatment; a phosphorus-removal facility, and advanced disinfection in support of enhanced disinfection capability. Other existing liquids treatment facilities at the WPCP would remain in place and would continue to provide wastewater treatment to anticipated flows.

Secondary Treatment Process

The existing secondary treatment involves 400-acre oxidation ponds, fixed growth reactors, and air flotation tanks constructed more than 30 years ago. Rehabilitation of the equipment inside the fixed growth reactors and pipes and pumps and upgrades to the air flotation tanks would improve the reliability and effectiveness of the treatment process. The new conventional activated sludge process (described in Chapter 3, Project Description) would replace the existing secondary treatment process in two phases through 2035. The upgrades and rehabilitation of the secondary treatment process, including the phased implementation of the conventional activated sludge process are driven by future regulations for nutrient removal, which are expected to be phased in over a number of years. Through the upgraded and new secondary treatment process, the Master Plan would improve the reliability and effectiveness of the secondary treatment process and improve the effectiveness of subsequent treatment processes. In addition, replacement of the aging facilities with more modern equipment for removal of suspended solids and scum would also contribute to improved effluent water quality.
### TABLE 4.10-9
SUMMARY OF IMPACTS – WATER QUALITY

<table>
<thead>
<tr>
<th>Impact</th>
<th>Master Plan</th>
<th>Water Purification Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>WQ-1: Master Plan compliance with applicable water quality regulations, objectives</td>
<td>LS</td>
<td>N/A</td>
</tr>
<tr>
<td>WQ-2: Increased volume of discharge to San Francisco Bay</td>
<td>LS</td>
<td>N/A</td>
</tr>
<tr>
<td>WQ-3: Master Plan compliance with Title 22 recycled water requirements</td>
<td>LS</td>
<td>N/A</td>
</tr>
<tr>
<td>WQ-4: Increased methylmercury production from pond breaching</td>
<td>LSM</td>
<td>N/A</td>
</tr>
<tr>
<td>WPF-WQ-1: Effects of WPF water on groundwater quality</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>WPF-WQ-2: Use of WPF water for potable purposes</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>WPF-WQ-3: Reduced volume of discharge to San Francisco Bay</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>WPF-WQ-4: Effects of RO concentrate stream on water quality</td>
<td>N/A</td>
<td>LSM</td>
</tr>
</tbody>
</table>

N/A = Not Applicable  
LS = Less than Significant impact, no mitigation required  
LSM = Less than Significant with Mitigation
Tertiary Treatment Process

The existing tertiary treatment process at the WPCP consists of filtration and disinfection. The tertiary-treated wastewater is discharged into Moffett Channel in the wet season under the Waste Discharge Order No. R2-2014-0035, NPDES No. CA0037621. The Master Plan would involve rehabilitation of and upgrades to the filtration equipment. Upgrades to the disinfection infrastructure would be driven by the secondary treatment process and regulatory requirements governing the levels of certain chemicals in the effluent such as disinfection byproducts discussed in Section 4.10.2.2 above. As described in Chapter 3, Project Description, the existing disinfection process would be replaced by chloramine or ultraviolet (UV) disinfection depending on the phased implementation of the split-flow secondary treatment process and regulations for disinfection byproducts such as trihalomethanes. Again, depending on the SWRCB regulations on emerging contaminants of concern, an ozone disinfection facility may be required. Similarly, in anticipation of meeting future limits on phosphorus, a Phosphorus Recovery Facility may be built. Thus, rehabilitation and upgrades to the tertiary treatment process would enhance the disinfection and filtration capability to meet the future regulatory requirements.

In summary, the proposed Master Plan improvements would result in enhancements and increased reliability of the wastewater treatment process at the WPCP and continue to comply with the water quality requirements in the NPDES Permit, which would be reissued or modified to reflect the changes in the treatment processes. The NPDES Permit incorporates the water quality objectives from the Basin Plan that are protective and the beneficial uses of the receiving waters and the receiving water quality and the effluent resulting from the wastewater treatment at the WPCP would be subject to and required to comply with the NPDES permit. The impact would thus be less than significant.

Mitigation: None required.

Impact WQ-2: Master Plan implementation would increase the volume of discharge via the existing outfall in San Francisco Bay, a less-than-significant impact.

Table 3-2 in Chapter 3 shows the current and proposed effluent flows discharged into Moffett Channel. As shown in the table, even with an increase in the average dry weather effluent flow discharge from current (15.9 mgd) to 19.5 mgd by 2035, the average dry weather effluent flow discharge would continue to remain below or within the permitted effluent flow of 29.5 mgd. Discharge would be anticipated to incrementally increase based upon development rates, over the 20-plus year Master Planning Period (to 2035), with resulting effluent discharge approximately 2.7 mgd greater in 2035 than existing conditions. Assuming a linear increase in inflow to the plant, an annual increase of 0.13 mgd per year could be expected. Moffett Channel and Guadalupe Slough are tidally influenced up to and above the City’s discharge point, and salinity levels are highly variable due to complex mixing processes that occur within the channel.
on a diurnal basis. As such, salinity patterns would not be anticipated to be affected by this incremental change in freshwater effluent levels, as the discharge volume is minor compared to tidal mixing, and diurnal and seasonal tidal patterns would remain unchanged. All discharges would continue to be consistent with NPDES permitting requirements, and Master Plan implementation would be consistent with RWQCB Basin Plan policies encouraging the implementation of water recycling projects to reduce discharges to the Bay. Potential impacts to water quality would be less than significant.

**Mitigation:** None required.

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**Impact WQ-3:** The increased recycled water use under the Master Plan would be in compliance with Title 22 requirements that are protective of water quality and public health, a less-than-significant impact.

The City currently produces recycled water in batches for distribution throughout the northern portion of Sunnyvale, mainly for irrigation purposes and at a smaller scale for construction use at remote locations through a truck fill facility located at the WPCP. The recycled water is treated to meet Title 22 requirements for water quality. Approximately 1.2 mgd of recycled water is delivered to over 100 customers (RWQCB, 2009). Under the proposed Master Plan, the City would increase the recycled water supply and serve additional clients. The recycled water production is estimated to double and would be delivered to a greater number of customers. The recycled water would continue to be used for irrigation purposes as well as potential high-end industrial uses especially with the inclusion of microfiltration in the treatment process, which are regulated by DDW and the recycled water requirements under Title 22.

The Porter-Cologne Water Quality Act (discussed in Section 4.10.2.2, State regulations, above) designates the SWRCB as the agency responsible for formulating and adopting state policy for water recycling, while the CDPH (now, DDW) is responsible for establishing and implementing uniform statewide reclamation criteria to ensure that the use of recycled water would not be detrimental to public health. Under Title 22 water quality criteria, the tertiary-treated and microfiltered recycled water generated under the Master Plan would qualify for high-end industrial use and for continued irrigation purposes. The recycled water would be in compliance with the Title 22 requirements and therefore protective of public health. Therefore, the impact is considered less than significant.

**Mitigation:** None required.

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**Impact WQ-4:** Oxidation pond breaching and/or restoration could increase methylmercury production, a less-than-significant impact with mitigation.

Proposed restoration activities of the oxidation ponds could cause increased levels of metals, including mercury, by increasing rates of metal-laden sediment suspension. Increases in sediment
suspension could occur during project construction—due to levee removal or restoration activities, for example—or could occur following restoration as a result of resuspension of sediment due to changes in pond hydrodynamics. The extent to which such changes would affect resuspension would depend upon final project design, which would be evaluated during project-level environmental analysis.

The potential effects of restoration activities on methylmercury production have been reviewed extensively in support of salt marsh restoration proposed (separate from the project) in nearby areas of the South Bay (EDAW et al, 2007; AECOM, 2015). Sediment mercury concentrations in the oxidation ponds are expected to be similar to concentrations found in the suspended sediments of the Lower South Bay. Sediment methylmercury concentrations in the Lower South Bay are slightly elevated. Because introduction of tidal flow would result in short water residence times, methylation rates should remain low and impacts would be less than significant. In light of the conclusions and recommendations drawn therein, in comparison to existing conditions, breaching of the oxidation ponds would be expected to result in a net increase in the area of productive wetlands and marshes. Sediment-dwelling anaerobic bacteria living within these communities can convert mercury to methylmercury, which can then be released into the overlying water column, resulting in increased waterborne concentrations of methylmercury. The extent to which increases in methylmercury generation could occur as a result of oxidation pond restoration would depend on final project design, which would then be evaluated during project-level environmental analysis. However, in general, implementation of oxidation pond restoration could result in a net increase in mercury resuspension and methylmercury production. Implementation of **Mitigation Measure WQ-4, Water Quality Evaluation and Control Plan for Oxidation Pond Breaching and Restoration**, which requires that the City conduct a water quality assessment and control plan for the oxidation ponds prior to breaching and/or restoration, would reduce this impact to a less-than-significant level.

**Mitigation Measures**

**Mitigation Measure WQ-4: Water Quality Evaluation and Control Plan for Oxidation Pond Breaching and Restoration**

During design of oxidation pond breaching and/or restoration, the City, in coordination with other agencies directly involved in planning and implementing of restoration activities, shall require preparation of a water quality evaluation for the proposed levee breach and associated pond restoration activities. The water quality evaluation shall evaluate anticipated construction activities and anticipated changes to pond area and nearby hydrodynamics, and evaluate their potential to influence each of the water quality parameters discussed in this analysis: temperature, salinity, DO, metals, mercury, methyl mercury, phytoplankton blooms, and nuisance algae. The water quality evaluation shall consider applicable water quality standards and goals defined in the Basin Plan, the Bay Conservation and Development Commission’s Bay Plan Policies on Water Quality, as applicable, and other applicable water quality standards. The water quality evaluation shall provide recommendations for the minimization of each category of potential water quality pollutants described above, sufficient to ensure that downstream beneficial uses would not be adversely affected, and that applicable water quality standards would not be exceeded. The City shall implement all recommendations identified in the water quality
4.10.3.5 Water Purification Facility Impacts and Mitigation Measures

Impact WPF-WQ-1: Water generated at the WPF, when used for Groundwater Replenishment (GWR), could adversely affect groundwater quality, a less-than-significant impact.

With implementation of the WPF, purified recycled water would be used for groundwater replenishment through either pipeline delivery to the District’s existing Los Gatos recharge basins, or through implementation of proposed injection wells located in an area roughly bordered by State Route 85, San Tomas Aquino Creek, Calabazas Creek, and the confined zone. Thus, introduction of high-quality purified water for GWR would have a potential to affect groundwater quality. Wells used for public supply are present downgradient from the proposed injection wells and recharge basins (SCVWD, 2013). However, as discussed above, the purified water generated at the proposed WPF would be high quality water produced through advanced treatment of wastewater. Prior to implementation of the WPF, the City/District would apply for and obtain a permit and regulatory approval from the RWQCB, which would require a detailed compliance assessment of the purified water with the Water Recycling Criteria of GWR. These criteria for groundwater replenishment have been specifically developed to be protective of public health.

As previously noted, the District has completed a Salt and Nutrient Management Plan for the Santa Clara Subbasin. To evaluate the projected future ground water quality concentrations, the SNMP estimates the annual current and future salt and nutrient loading of the aquifer by estimating the loading from a variety of sources, including rainfall, mountain-front recharge, managed recharge in streams, managed recharge in recharge basins, agricultural irrigation, landscape irrigation from municipal, domestic, and purified water source, conveyance losses, drainage losses, agricultural and lawn fertilizer, and atmospheric deposition. The annual volumes of salt and nutrient removal from the aquifer are estimated from groundwater pumping, basin outflow, gaining reaches of streams, groundwater infiltration into sewer lines and storm drains, and storm drain infiltration. Subtracting the removal from the loading provides an estimate of how much additional loading the aquifer can take without exceeding the Basin Plan Objectives. Based on the salt and nutrient loading estimates, the District concluded that there is available assimilative capacity within the aquifers.
The Sunnyvale WPCP produces tertiary-treated recycled water with a TDS of approximately 870 mg/L (TDS ranged from 771 to 965 mg/L between 2002 and 2011). The SNMP included the use of approximately 30,000 AFY of recycled water within the basin. The analysis also assumed that implementation of the Master Plan would reduce recycled water TDS from that facility to 760 mg/L in 2023. However, the TDS of purified water produced by the WPF would range from 20 to 40 mg/L. Use of this low TDS supply for groundwater replenishment would have a beneficial effect on groundwater quality from a TDS standpoint, and would provide a low TDS supply to the groundwater basin. As such, potential impacts to water quality are considered less than significant.

Prior to implementation of the WPF, the District would be required to apply for and obtain the following regulatory permit for groundwater replenishment within the Santa Clara Subbasin.

- Title 22 compliant Water Recycling Requirements issued by the Regional Water Quality Control Board following approval of an Engineering Report by the Division of Drinking Water.

Issuance of this permit would be contingent upon implementation of various water quality studies, an assessment of compliance with GWR regulatory requirements, and approval of specific WPF operating conditions. A detailed water quality assessment would involve evaluating the concentrations of the regulated constituents and toxicity as well as specific additional constituents as identified and required by the RWQCB. The City/District will obtain a permit prior to implementing the WPF. The water quality requirements that the recycled water would be subject to would be protective of the environment. The specific requirements are discussed in Section 4.10.2, Regulatory Setting and would include a series of programs such as source control and monitoring of constituents including contaminants of emerging concern which would be implemented by the District, in coordination with the City and other agencies. In addition, these regulations would require the groundwater replenishment facilities to be located such that purified water is retained underground for a period long enough that the District would have sufficient time to identify treatment failures and implement actions to protect public health (a minimum of two months, as determined pursuant to Title 22). With regular compliance of the regulatory requirements that are protective of groundwater quality and public health, the use of recycled water for groundwater replenishment would not have a significant water quality impact.

**Mitigation**: None required.

**Impact WPF-WQ-2**: Water generated at the WPF used for GWR would potentially be used for potable purposes, a less-than-significant impact.

Advanced treatment involving RO and UV disinfection would generate high-quality purified water for groundwater replenishment. The water would be indirectly used for potable purposes and would be subject to the June 2014 Title 22 Groundwater Recharge Regulations described
above in Section 4.10.2, Regulatory Setting above. The entire activity of GWR and withdrawal of water through the wells would be subject to monitoring and specific drinking water source control programs discussed above. If the water would be disinfected using ozone or disinfection agents other than UV light, then the water distribution system would be subject to the testing, monitoring, reporting, and any corrective action requirements under the CDPH rule on disinfection byproducts. The District would apply for and obtain a permit from the RWQCB prior to implementation of the WPF and would conduct detailed water quality monitoring to assess its compliance with the regulations protective of the environment and public health.

As described in Chapter 3, Project Description, the proposed MBR treatment is reported to have high removal efficiency of contaminants compared to existing technologies. The water generated would be subject to Title 22 requirements, which are protective of the environment and public health. With compliance with the regulatory requirements that are protective of water quality, the WPF would result in a less-than-significant impact.

Mitigation: None required.

Impact WPF-WQ-3: Increased recycled water production by the WPF would reduce the discharge through the existing outfall into the Bay, a less-than-significant impact.

With implementation of the WPF, the secondary-treated wastewater from the WPCP would undergo advanced treatment through membrane bioreactors, reverse osmosis, and UV disinfection and advanced oxidation. The WPF at the WPCP would be designed to generate 10 mgd of high-quality recycled water and could be expanded to 15 mgd, should recycled water demands increase in the future. With implementation of the WPF, there would be a corresponding reduction in the discharge flow released through the existing outfall in the Bay; when compared to projected 2035 average dry weather flow of 19.5 mgd, implementation of the WPF would reduce effluent discharge by approximately 12.5 mgd\(^7\), resulting in an average dry weather flow volume of 7.0 mgd. This volume would be reduced compared to existing average dry weather discharge of 15.9 mgd, or a reduction of approximately 8.9 mgd at buildout. As previously noted, Moffett Channel and Guadalupe Slough are tidally influenced to Mathilda Avenue and beyond Tasman Drive, respectively (see Section 4.9, Hydrology), above the City’s discharge point, and salinity levels are highly variable due to complex mixing processes that occur within the channel on a diurnal basis. The primary influence on water quality in Moffett Channel the majority of the time would be the quality and quantity of inflowing Bay water. As such, receiving water salinity patterns would not be anticipated to be substantially changed by this alteration in effluent discharge levels, as in-channel effluent volumes are incremental compared to tidal mixing, and diurnal and seasonal tidal patterns would be unchanged. All discharges would continue to be consistent with NPDES permitting requirements, and Master

\(^7\) Assumes a reverse osmosis rejection rate of 25 percent; therefore, production of 10 mgd of purified water would require treatment of 12.5 mgd of effluent. The rejection rate of RO treatment is subject to several factors, and will be determined as part of project design. This rate is assumed in order to estimate and review potential reductions in effluent discharge levels.
Plan implementation would be consistent with RWQCB Basin Plan policies encouraging the implementation of water recycling projects to reduce discharges to the Bay. Potential impacts would be less than significant.

Mitigation: None required.

Impact WPF-WQ-4: Increased recycled water production using reverse osmosis treatment processes under the WPF would generate a new concentrate stream. Concentrate management would have the potential to affect receiving water quality, a less-than-significant impact with mitigation.

Implementation of the WPF would produce 10 mgd of purified water. The level of RO concentrate generated by the production of 10 mgd of purified water is subject to several factors. In the RO process, molecular constituents (i.e., calcium, magnesium, sodium, etc.) larger than the molecular pore size of the membrane would not pass through and would exit the membrane system as RO concentrate. Demineralized water molecules would pass through the membrane and exit the system as purified water to be used for groundwater recharge. It is expected that the RO process would recover 75 percent of the secondary treated effluent as purified water, with the remaining 25 percent becoming RO concentrate. For discussion purposes, an RO rejection rate of 25 percent is used to estimate RO concentrate volumes that would need to be managed. Using this rate, treatment of approximately 12.5 mgd of effluent would be necessary to generate 10 mgd of purified water, with corresponding generation of approximately 2.5 mgd of RO concentrate. As described in Chapter 3, Project Description, three options are being considered to manage the RO concentrate:

1) discharge into the Bay through City’s existing shallow water outfall;
2) release into treatment or engineered wetlands;
3) discharge into the Bay through East Bay Dischargers Authority (EBDA) existing outfall.

The City/District would be required to conduct a compliance assessment of the RO concentrate with the water quality objectives, which would involve detailed testing and studying of constituents, especially those with a potential to exceed the water quality objectives. Toxicity would also be tested under different conditions and the water quality would be fully evaluated prior to obtaining NPDES permit approval for discharge of RO concentrate. Whole effluent toxicity can be acute or chronic, and both effects would be evaluated. Acute toxicity is defined as a median of less than 90 percent or 70 percent survival, 10 percent of the time, of test organisms in a 96-hour flow test. Chronic toxicity is a detrimental biological effect on growth rate, reproduction, fertilization success, larval development, population abundance, community composition, or any other relevant measure of the health of an organism, population, or community. Chronic toxicity generally results from exposures to pollutants exceeding 96 hours; however, it also may be detected through short-term exposure of critical life stages of organisms (RWQCB, 2013). The City/District would obtain and comply with NDPES permit requirements.
throughout the operation of the WPF. Specific differentiating aspects related to the options are discussed below.

Discharge to Existing Outfall

The RO concentrate would be mixed with treated effluent and discharged to the City’s existing outfall. As discussed above (under “NPDES Permit for the Sunnyvale WPCP” in Section 4.10.2.2), the regulated discharge from the WPCP through the existing outfall does not currently achieve the required 10:1 dilution, so the City/District would coordinate closely with the RWQCB to evaluate the water quality of the RO concentrate, its impact on dilution, and compliance with receiving water quality objectives.

The Sunnyvale WPCP’s average flow discharged to Moffett Channel is 13.2 mgd and is projected to increase to 15.9 mgd by 2035. Using a RO rejection rate of 25 percent, treatment of approximately 12.5 mgd of effluent would be necessary to generate 10 mgd of purified water, with corresponding generation of approximately 2.5 mgd of RO concentrate. This would be blended into the remaining treated effluent (3.4 mgd) for discharge to Moffett Channel. Use of blending as a RO concentrate management strategy would have the potential to increase the effluent concentrations of constituents of concern, including metals and pesticides. However, the mass load of constituents would be the same, as the effluent that would be treated to generate purified water is currently discharged to Moffett Channel. Based upon this scenario, RO concentrate would comprise approximately 42 percent of the effluent, and would be unlikely to comply with concentration-based effluent limitations for constituents of concern.

Use of blending as a RO concentrate management strategy would have the potential to alter chronic and acute toxicity of the effluent currently discharged to Moffett Channel. According to the San Francisco Bay Basin Plan (RWQCB, 2013), all waters should be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms. Detrimental responses include, but are not limited to, decreased growth rate and decreased reproductive success of resident or indicator species.

Release of blended RO concentrate has been approved by the RWQCB for other facilities in the South Bay and San Pablo Bay, including Alameda County Water District’s Desalination Plant and the Richmond Advanced Recycled Expansion (RARE) Project. Concentrate management via blending has also been reviewed for the City of San José and the Silicon Valley Advanced Water Purification Center. The ability of this option to fully meet the RO concentrate management needs of the WPF at 10 mgd is limited by the ability to comply with water quality requirements and effluent limits as established under the City’s NPDES permits. Implementation of this RO concentrate management option would require the identification of the maximum size RO facility that can be operated under the City’s NPDES permits, including identification of appropriate dilution levels to comply with effluent limits for constituents of concern, and acute and chronic toxicity.

Based upon the discussion of effluent changes identified above, it is unlikely that this disposal option could fully meet the RO concentrate management needs of the 10 mgd WPF without some
type of additional blending source (such as stormwater or pre-blending with Bay water), implementation in combination with one of the other options identified below, or possibly supplemental treatment of the RO concentrate prior to discharge. Blending of RO concentrate generated by a smaller facility, such as a 4-6 mgd facility, would have the potential to achieve compliance with NPDES permit requirements, if used in combination with one of the other options available to the City, as discussed below. Implementation of this option would require an amendment to or reissuance of the existing WPCP NPDES permit after implementing special studies to identify specific effluent blending ratios, assessing the use of potential source waters for blending, (such as pre-blending with Bay water or stormwater), calculating specific concentrations of constituents of concern (metals, pesticides), and identifying chronic and acute toxicity impacts.

**Discharge to Treatment Wetlands**

The RO concentrate would be introduced into treatment wetlands or engineered wetlands. Based on studies under the SBWR Plan (SCVWD and City of San José, 2014), engineered fresh and brackish water wetlands increase the TDS concentration of the RO concentrate while reducing the concentration of nutrients and trace contaminants in RO concentrate. The soils and plants in engineered wetlands can reduce dissolved organic carbon and nitrogen, ammonia and phosphorus through biological activity and adsorption. The wetlands also result in increased evapotranspiration that effectively increases the salinity of the effluent. Pilot feasibility studies conducted by City of Oxnard for using treatment wetlands as a mechanism of treatment for RO concentrate such that the effluent can be used as source water for coastal wetland restoration showed significant mass removal rates for nitrate (75 percent), nitrite (51 percent), total nitrogen (48 percent) and limited reductions for total organic carbon (TOC) (9 percent), selenium (36 percent), and calcium (7 percent). Whole effluent toxicity testing conducted by the City of Oxnard showed decreases for both acute and chronic toxicity to indicator organisms. The engineered wetlands enhanced the evapotranspiration rate to reduce the overall volume of RO concentrate, where the final TDS concentration in the effluent is projected to fall within a range of 15,000 to 25,000 mg/L, which could possibly serve as source water to support restoration of tidal wetlands. While engineered wetlands provide beneficial treatment to RO concentrate, treated effluent from the wetlands would have to be conveyed to another location for ultimate disposal, which would require either a new NPDES permit or permit amendment (SCVWD and City of San José, 2014).

One potential location for engineered wetlands is at Ponds 1 and 2. The City would prepare a water quality assessment to study the changes in the receiving water quality in the oxidation ponds as the RO concentrate is discharged. The City would adopt an adaptive management approach (as approved by the RWQCB) as necessary in obtaining the NPDES permit and as required under the permit. If the City’s oxidation ponds are pursued for this use, then the actual space available would need to be analyzed in greater detail and refined evaporation calculations would need to be prepared. Detailed water quality studies would be conducted (discussed above) as part of the permit compliance. The City would conduct periodic wetlands maintenance (e.g. structural inspections, vector management, and vegetation management). Use of the oxidation ponds for wetlands treatment of RO concentrate likely would constrain potential restoration options.
Discharge to Deepwater Bay outfall

As discussed above, the regulated discharge from the WPCP through the existing outfall does not achieve the Basin Plan requirement of 10:1 dilution. To achieve a higher dilution, the RO concentrate generated at the proposed WPF could be piped to the existing deepwater outfall operated by EBDA, mixed with the EBDA combined effluent, and released into the Bay. EBDA currently receives a 10:1 dilution credit that is used to calculate effluent limits for non-bioaccumulating toxic pollutants such as copper and a dilution credit of 79:1 for ammonia. Each agency in the EBDA system is required to meet technology based limits for secondary effluent (CBOD, TSS, pH) at their treatment plants, but compliance with water quality based effluent limits and toxicity requirements are determined at the combined discharge point. Discharge of RO concentrate generated by the proposed WPF could be considered an industrial discharge to the EBDA system or could require an amendment to EBDA’s existing NPDES permit. Additional considerations would include available wet-weather capacity in the EBDA system. The City/District would conduct a detailed water quality and engineering analysis to predict combined effluent quality, evaluate compliance with Basin Plan objectives, and assess impacts to facility operations.

Mitigation Measures

Mitigation Measure WPF-WQ-4: RO Concentrate Management Study

In coordination with regulatory agencies, the City and/or District will develop a RO concentrate management study that identifies phasing and implementation of RO concentrate management options that maintain compliance with applicable NDPES permit requirements.

• For use of the City’s existing outfall, the study will review compliance with NPDES permit requirements under conditions of blending the RO concentrate with the remaining available WPCP effluent. The studies will generally include: development of blended effluent and RO concentrate mass balance calculations and laboratory chronic toxicity testing of a range of effluent and RO concentrate blends to evaluate compliance with the City’s NPDES permit limits.

• For use of the EBDA outfall, the City and/or District will review discharge requirements and other institutional arrangements for participation in EBDA. This would include: development of RO concentrate mass balance calculations and laboratory testing to evaluate compliance with EBDA’s combined NDPES permit requirements.

• For use of treatment wetlands, the City and/or District will coordinate with the RWQCB and other regulatory agencies, such as USACE, USFWS, CDFW, and BCDC regarding use of concentrate to support wetlands and protect receiving water quality consistent with the water quality objectives of the San Francisco Bay Water Quality Control Plan (Basin Plan). This process will generally include development of effluent calculations, pilot testing, or other mechanism acceptable to the RWQCB to identify:
  − Effluent blending ratios,
  − Use of other potential blending source waters (such as pre-blending with Bay water or stormwater),
4.10.4 References


California Department of Public Health, Final Statement of Reasons, Disinfectant Residuals, Disinfection Byproducts and Disinfection Byproduct Precursors, Notice of Proposed Rulemaking, DPH-09-004, Disinfectant Residuals, Disinfection Byproducts, and Disinfection Byproduct Precursors, Title 22, California Code of Regulations, 2012.


Department of Water Resources (DWR), Alluvial Groundwater Basins and Subbasins within the San Francisco Bay Hydrologic Region Map, 2004.


4. Environmental Setting, Impacts, and Mitigation Measures

4.10 Water Quality


RWQCB, Order No. 96-011, General Water Reuse Requirements for Municipal Wastewater and Water Agencies, 1996.


RWQCB, San Francisco Bay Water Quality Control Plan (Basin Plan), 2013.


4. Environmental Setting, Impacts, and Mitigation Measures

4.10 Water Quality


United States Environmental Protection Agency (U.S. EPA), Underground Injection Control, Aquifer Recharge (AR) and Aquifer Storage & Recovery (ASR), Accessed online at http://water.epa.gov/type/groundwater/uic/aquiferrecharge.cfm on April, 13, 2015, 2012.


4.11 Hazards and Hazardous Materials

This section describes and evaluates issues related to hazards and hazardous materials in the context of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan and Water Purification Facilities (WPF). Discussed are the physical and regulatory setting, the baseline for determining environmental impacts, the criteria used for determining the significance of environmental impacts, and potential impacts and appropriate mitigation measures associated with implementation of the Master Plan or WPF.

4.11.1 Setting

This section describes the existing conditions of the project area with respect to hazards and hazardous materials. It discusses the potential to encounter hazardous materials in soil and/or groundwater in the project area, the hazardous materials currently stored and used at the WPCP, potential fire hazards, and potential hazards related to proximity to schools and airports.

4.11.1.1 Definition of Hazardous Materials

The term “hazardous materials” refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases). The term “hazardous material” is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment.1

In some cases, past industrial or commercial activities on a site could have resulted in spills or leaks of hazardous materials to the ground, resulting in soil and/or groundwater contamination. Hazardous materials may also be present in building materials and released during building demolition activities. If improperly handled, hazardous materials can cause health hazards when released to the soil, groundwater, or air. Individuals are typically exposed to hazardous materials through inhalation or bodily contact. Exposure can come as a result of an accidental release during transportation, storage, or handling of hazardous materials. Disturbance of subsurface soil during construction can also lead to exposure of workers or the public from stockpiling, handling, or transportation of soils contaminated by hazardous materials from previous spills or leaks.

4.11.1.2 Current WPCP Hazardous Materials Storage Information

Current operations at the WPCP require the use of hazardous materials. Table 4.11-1 below identifies hazardous materials storage and usage information for the WPCP. Storage and use of hazardous materials at the WPCP are permitted by the City of Sunnyvale Department of Public

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1 State of California Health and Safety Code Chapter 6.95, Section 25501(p).
Safety under a Fire Prevention and Environmental Programs Consolidated Permit, in compliance with state and local hazardous materials safety standards. Recently permitted materials stored or used at the WPCP include flammable gas, non-flammable gas, flammable liquids, oxidizers, and corrosives (Sunnyvale Department of Public Safety, 2010). The Sunnyvale WPCP provided the following table of chemicals in use for the year 2010.

**TABLE 4.11-1**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Total</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>339,620</td>
<td>Gallons per year</td>
</tr>
<tr>
<td>Sodium bisulfite</td>
<td>123,840</td>
<td>Gallons per year</td>
</tr>
<tr>
<td>Polymer – DMF (dual media filters)</td>
<td>17,960</td>
<td>Gallons per year</td>
</tr>
<tr>
<td>Polymer – AFT (air flotation tanks)</td>
<td>98,530</td>
<td>Gallons per year</td>
</tr>
</tbody>
</table>

SOURCE: City of Sunnyvale, 2015

The uses of the chemicals listed above are as follows:

- Sodium hypochlorite (12.5% solution) is used to disinfect the treated water prior to discharge to Moffett Channel or use as recycled water. The sodium hypochlorite is stored in tanks. Human exposure to sodium hypochlorite can cause severe skin burns and eye damage. Sodium hypochlorite is also very toxic to aquatic life (National Center for Biotechnology Information [NCBI], 2015a).

- Liquid sodium bisulfite is currently used at the WPCP to dechlorinate recycled water and the “Number 3” water stream (i.e., treated wastewater used in treatment processes) (EOA, 2008). Sodium bisulfite is stored in one storage tank in the Recycled Water Pump Station. Sodium bisulfite is corrosive and a skin irritant (NCBI, 2015b).

- Polymer DMF refers to a proprietary organic material used in the dual media filters.

- Polymer AFT refers to a proprietary organic material placed in the air flotation tanks (AFTs).

**4.11.1.3 Hazardous Building Materials**

Hazardous materials, such as asbestos-containing materials (ACM), lead-based paint (LBP), and polychlorinated biphenyls (PCBs), may also be contained in building materials and released during demolition activities. The likelihood of hazardous materials in building components can be generally assessed based on the age of the buildings, as these materials were phased out of use during the 1970s and 1980’s. As shown in **Table 4.11-2**, many of the structures to be demolished at the WPCP during the Master Planning Period were constructed between 1956 and 1989 and may therefore contain hazardous building materials. Demolition would generally occur in the
western two-thirds of the WPCP site, and would include the primary sedimentation tanks, primary control building, air flotation tanks, existing administration building, and the household hazardous waste facility. An assessment of the hazardous materials content of the facilities to be demolished has not been performed.

### TABLE 4.11-2

**EXISTING BUILDING AND STRUCTURE CONSTRUCTION DATES**

<table>
<thead>
<tr>
<th>Buildings</th>
<th>Construction Date(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Sedimentation Tanks 1-3</td>
<td>1956 and 1970</td>
</tr>
<tr>
<td>Primary Sedimentation Tanks 4-6</td>
<td>1962 and 1970</td>
</tr>
<tr>
<td>Primary Sedimentation Tanks 7-9</td>
<td>1970</td>
</tr>
<tr>
<td>Dissolved Air Flotation 1-3</td>
<td>1975</td>
</tr>
<tr>
<td>Fixed Growth Reactors 1-3</td>
<td>1975</td>
</tr>
<tr>
<td>Dual Media Filters 1-3</td>
<td>1975</td>
</tr>
<tr>
<td>Chlorine Contact Tanks 1-4</td>
<td>1975</td>
</tr>
<tr>
<td>Dual Media Filter 4</td>
<td>1980</td>
</tr>
<tr>
<td>Auxiliary Pump Station</td>
<td>1982</td>
</tr>
<tr>
<td>Administration Building</td>
<td>1982 and 1989</td>
</tr>
<tr>
<td>Laboratory Building</td>
<td>1984 and 1989</td>
</tr>
<tr>
<td>Primary Sedimentation Tank 10</td>
<td>1984</td>
</tr>
<tr>
<td>Dissolved Air Flotation 4</td>
<td>1984</td>
</tr>
<tr>
<td>Chlorine Contact Tank 4</td>
<td>1984</td>
</tr>
</tbody>
</table>

**SOURCE:** Brown and Caldwell, 2009

### Asbestos Potential

Asbestos is a naturally occurring fibrous material that was used as a fireproofing and insulating agent in building construction before such uses were banned by the U.S. Environmental Protection Agency (U.S. EPA) in the 1970’s, although some nonfriable\(^2\) use of asbestos in roofing materials still exists. The presence of asbestos can be found in such materials as ducting insulation, wallboard, shingles, ceiling tiles, floor tiles, insulation, plaster, floor backing, and many other building materials. ACMs are considered both a hazardous air pollutant and a human health hazard. The risk to human health is from inhalation of airborne asbestos, which commonly occurs when ACMs are disturbed during demolition and renovation activities. Based on the age of the buildings at the WPCP, it is likely that ACMs are present.

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\(^2\) Nonfriable asbestos refers to ACMs that contain asbestos fibers in a solid matrix that does not allow for them to be easily released.
4. Environmental Setting, Impacts, and Mitigation Measures
4.11 Hazards and Hazardous Materials

Lead Potential

Lead and lead compounds can be found in many types of paint. In 1978, the Consumer Product Safety Commission set the allowable lead levels in paint at 0.06 percent by weight in a dry film of newly applied paint. Lead dust is of special concern, because the smaller particles are more easily absorbed by the body. Common methods of paint removal, such as sanding, scraping, and burning, create excessive amounts of dust. Lead based paints are considered likely present in buildings constructed prior to 1960, and potentially present in buildings built prior to 1978. Since multiple structures located onsite were built prior to the federal regulations banning the use of lead based paints, LBP is likely to be present.

PCBs Potential

PCBs are organic oils that were formerly placed in many types of electrical equipment, such as transformers and capacitors, primarily as electrical insulators. They may also be found in hydraulic fluid used for hoists, elevators, etc. Years after widespread and commonplace installation, it was discovered that exposure to PCBs may cause various health effects and that PCBs are highly persistent in the environment. The EPA has listed these substances as carcinogens. PCBs were banned from use in electrical capacitors, electrical transformers, vacuum pumps, and gas turbines in 1979. Electrical equipment at the WPCP may contain PCBs.

4.11.1.4 Hazardous Materials in Soil and Groundwater

This section assesses the potential to encounter hazardous materials in soil and groundwater as a result of a previously documented releases of hazardous materials on the Master Plan area or in the nearby area. This discussion is based on the results of regulatory agency database searches, available WPCP sampling investigation reports, and documents related to the City of Sunnyvale Landfill. California Government Code Section 65962.5 requires state and local agencies to compile and update, at least annually, lists of hazardous waste sites and facilities. While Government Code Section 65962.5 makes reference to a “list”, commonly referred to as the Cortese List, this information is currently available from the following online data resources (California Environmental Protection Agency [CalEPA], 2015):

- List of hazardous waste and substances sites - California Department of Toxic Substances Control (DTSC) EnviroStor database (DTSC, 2015a);
- List of leaking underground storage tank (LUST) sites – State Water Resources Control Board (SWRCB) GeoTracker database (SWRCB, 2015);
- List of solid waste disposal sites with waste constituents above hazardous levels outside the management unit (SWRCB, 2014a);
- List of active cease and desist orders and cleanup and abatement orders that concern the discharge of wastes that are hazardous materials (SWRCB, 2014b); and,
- List of hazardous waste facilities subject to corrective action (DTSC, 2014).
Information regarding the potential presence of subsurface contamination at the WPCP and the WPF project areas is discussed below. Identified sites include the following types of environmental cases:

- **Envirostor Certified/Operation & Maintenance** – These are former industrial manufacturing facilities. Following environmental cleanup, residual contamination remains in soil and/or groundwater. The DTSC has determined that contamination is not a threat to human health or the environment if undisturbed; however, land use restrictions apply to any subsurface excavation.

- **Envirostor DTSC Sites** – The DTSC oversees cleanup at facilities with a variety of environmental concerns. It also identifies facilities for further investigation based on their past or present uses, which could have caused hazardous materials releases.

- **GeoTracker LUST Cleanup Sites** – LUST sites are typically listed as a result of a release of petroleum hydrocarbons such as diesel, gasoline, motor oil and waste oil. A few sites are listed because of releases of dry cleaning solvents. Open cases may be in the site assessment phase to investigate the extent of known releases or undergoing active remediation of groundwater contamination.

- **GeoTracker Closed LUST Sites** – The SWRCB issues case closure to sites with limited releases and a low threat to water quality. Low levels of contaminants may remain in soil and groundwater.

**Table 4.11-3** summarizes information regarding the listed DTSC sites and the open LUST sites within ¼-mile of project components that are identified on Figures 4.11-1 and 4.11-2. Closed LUST sites are not discussed but are presumed to have had petroleum hydrocarbon releases in the past. Because DTSC cleanup sites tend to be larger and encompass a wider variety of contaminants than LUST sites, additional information regarding these sites is presented in Table 4.11-3.

**Master Plan**

The WPCP was not identified as a known hazardous materials site on any of the Cortese List databases; however, two facilities were identified within the Master Plan area between Carl Road and Caribbean Drive:

- City of Sunnyvale, BOP/Recycling Center, 164 Carl Road (SWRCB GeoTracker)
- City of Sunnyvale Landfill, North side of Caribbean Drive (CalRecycle, Solid Waste Information System, 2015).

**WPCP Site Investigation Results**

While the WPCP is not identified as a hazardous materials site by the Cortese List databases, a site investigation, consisting of 13 soil borings at locations throughout the WPCP, was conducted to evaluate the potential presence of contaminants that could affect construction activities. Soil and groundwater samples were analyzed for metals, semi-volatile organic compounds (SVOCs), pesticides, and PCBs. SVOCs and pesticides were not detected in soil samples; metals detected in soil included arsenic, barium, cadmium, chromium, lead and mercury; Aroclor 1260 (a PCB constituent) was only detected in one sample. All of the detected analytes were below the
### TABLE 4.11-3
HAZARDOUS MATERIALS SITES WITHIN 1/4-MILE OF MASTER PLAN PROJECT COMPONENTS

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Street Address</th>
<th>City</th>
<th>Status</th>
<th>Status Date</th>
<th>Past Use/Contamination Concerns</th>
<th>List</th>
<th>Adjacent Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunnyvale Landfill</td>
<td>Caribbean Drive</td>
<td>Sunnyvale</td>
<td>Open</td>
<td>1/1/2001</td>
<td>Landfill accepting municipal, construction, and non-hazardous commercial/industrial waste</td>
<td>Land Disposal Site</td>
<td>WPCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Potentially contaminated:</strong> Groundwater</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOC Recycling Center</td>
<td>164 Carl Road</td>
<td>Sunnyvale</td>
<td>Cleanup Completed – Case Closed</td>
<td>6/22/2005</td>
<td>Recycling yard - waste oil collection</td>
<td>LUST Cleanup Site</td>
<td>WPCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Potentially Contaminated:</strong> Soil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warner-Lambert/USPS</td>
<td>1587 Dell</td>
<td>Campbell</td>
<td>Active or Completed – Case Closed</td>
<td>6/17/2005</td>
<td>Industrial Inorganic Chemicals, NEC</td>
<td>Clean-up and Abatement Order</td>
<td>Recharge Basins</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Potentially contaminated:</strong> Soil and groundwater.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deluxe Check Printers</td>
<td>1551 Dell</td>
<td>Campbell</td>
<td>Land Use Covenant</td>
<td>6/17/2005</td>
<td>Chlorinated solvents in underground storage tanks</td>
<td>Clean-up and Abatement Order</td>
<td>Recharge Basins</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Potentially contaminated:</strong> Soil and groundwater.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pacific Aerospace Services</td>
<td>354 East McGlincey Lane</td>
<td>Campbell</td>
<td>Under Evaluation – Referred to RCRA</td>
<td>5/24/2007</td>
<td>Metal plating facility which used or produced metals, cyanides, chlorinated solvents, and other substances.</td>
<td>Envirostor</td>
<td>Recharge Basins</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Potentially contaminated:</strong> Soil and groundwater.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orchard Farm Shopping Center</td>
<td>6134 Bollinger Rd</td>
<td>San José</td>
<td>Certified O&amp;M - Land Use Restrictions Only</td>
<td>8/23/1993</td>
<td>Perchloroethene (PCE) from dry cleaners.</td>
<td>Envirostor</td>
<td>Well Injection Area</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Potentially contaminated:</strong> Soil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ashland Chemical Co., Campbell</td>
<td>1600 Dell Avenue</td>
<td>Campbell</td>
<td>Inactive - Needs Evaluation</td>
<td>None</td>
<td>Unknown; needs evaluation</td>
<td>Envirostor</td>
<td>Recharge Basins</td>
</tr>
<tr>
<td>Pacific Aerospace Svs., Inc.</td>
<td>354 McGlincey Lane</td>
<td>Campbell</td>
<td>Inactive - Needs Evaluation</td>
<td>6/20/2012</td>
<td>Metal plating- chrome.</td>
<td>Envirostor</td>
<td>Recharge Basins</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Potentially contaminated:</strong> Under investigation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedgwick Elementary School Expansion Project</td>
<td>10480 Finch Avenue</td>
<td>Cupertino</td>
<td>Active</td>
<td>2/10/2015</td>
<td>Underground storage tanks leaking benzene, metals, TPH-gasoline; organochlorine pesticides</td>
<td>Envirostor</td>
<td>Well Injection Area</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Potentially contaminated:</strong> Soil, soil vapor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 4.11-3 (Continued)
HAZARDOUS MATERIALS SITES WITHIN 1/4-MILE OF MASTER PLAN PROJECT COMPONENTS

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Street Address</th>
<th>City</th>
<th>Status</th>
<th>Status Date</th>
<th>Past Use/Contamination Concerns</th>
<th>List</th>
<th>Adjacent Component</th>
</tr>
</thead>
</table>
| Shell - 1804 Saratoga         | 1804 Saratoga Ave.   | San José   | Open - Eligible for Closure | 7/9/2015    | Gasoline  
**Potentially contaminated:** Aquifer used for drinking water supply                         | LUST Cleanup Site            | Well Injection Area                       |
| Beacon - 1370 Camden         | 1370 Camden Avenue   | Campbell   | Open - Eligible for Closure | 8/6/2013    | Benzene, Toluene, Xylene, MTBE / TBA / Other Fuel Oxygenates, Gasoline  
**Potentially contaminated:** Aquifer used for drinking water supply, Soil  | LUST Cleanup Site            | Recharge Basins                        |
| Dean's Goodyear               | 5291 Prospect Rd     | San José   | Open - Inactive             | 4/17/2009   | Diesel, Under Investigation                                                                 | Cleanup Program Site          | Well Injection Area         |
| Frank Foreign Car Service     | 3303 Winchester Blvd S | Campbell   | Open - Inactive             | 4/17/2009   | Diesel  
**Potentially contaminated:** Soil                                                                | Cleanup Program Site          | Recharge Basins                        |
| Chevron #9-1325               | 1704 Saratoga Avenue | San José   | Open - Remediation          | 9/23/2013   | MTBE / TBA / Other Fuel Oxygenates, Gasoline  
**Potentially contaminated:** Aquifer used for drinking water supply                         | LUST Cleanup Site            | Well Injection Area                       |
| Chevron #9-8354               | 1402 Camden Avenue   | Campbell   | Open - Site Assessment      | 3/23/2007   | Diesel, MTBE / TBA / Other Fuel Oxygenates, Gasoline  
**Potentially contaminated:** Other Groundwater (uses other than drinking water), Soil      | LUST Cleanup Site            | Recharge Basins                        |
| K & K Manufacturing           | 1500 Dell Ave        | Campbell   | Open - Site Assessment      | 9/16/1990   | Gasoline, Other Petroleum, Waste Oil / Motor / Hydraulic / Lubricating  
**Potentially contaminated:** Soil                                                              | Cleanup Program Site          | Recharge Basins                        |
| Dell Investments              | Dell Avenue          | Campbell   | Open - Site Assessment      | 10/17/2011  | Tetrachloroethylene (PCE)  
**Potentially contaminated:** Other Groundwater (uses other than drinking water), Soil, Soil Vapor  | Cleanup Program Site          | Recharge Basins                        |
Figure 4.11-1
Hazardous Materials Sites within One Half-Mile of WPF Injection Well Area

SOURCE: SWRCB, 2015; DTSC, 2015; California Department of Education, 2015a; 2015b
Figure 4.11-2

Hazardous Materials Sites and Schools within One Half-Mile of Recharge Basins

SOURCE: SWRCB, 2015; DTSC, 2015; California Department of Education, 2015a; California Department of Education, 2015b
California Regional Water Quality Control Board (RWQCB) Environmental Screening Level (ESL) for construction/trench workers, with the exception of arsenic in two samples. Because ESLs are conservative screening levels, the health risks of the detected chemicals were further evaluated using ProUCL, a US EPA software, and the US EPA’s Regional Screening Level calculator (Carollo/HDR, 2014). Based on the concentrations detected throughout the site, the presence of arsenic does not pose an unacceptable cancer or noncancer health risk. In addition, the soil is not considered a hazardous waste for disposal purposes (Carollo/HDR, 2014).

**Pond Sampling Results**

Sludge samples have occasionally been collected from the Sunnyvale oxidation ponds and analyzed for a variety of constituents including metals, SVOCs, VOCs, PCBs, total petroleum hydrocarbons (TPH), and pesticides. In 2011, laboratory analysis detected the following constituents in a sludge sample: 700 parts per million (ppm) TPH-diesel; 560 ppm TPH-motor oil; and various metals; pesticides, SVOCs, volatile organic compounds (VOCs), and PCBs were not detected (Calscience, 2011). In 2012, various metals, total nitrogen, phosphorus and ammonia were detected; two of the sludge samples contained arsenic, cadmium, copper, molybdenum, zinc, and boron were detected at levels above the RWQCB ESLs (RWQCB, 2013; Calscience, 2012). The sludge is currently hauled offsite by Synagro to be used as Class B biosolids for land application, landfiling, or composting at up to seven permitted facilities, none of which accept hazardous materials.

**BOP/Recycling Center**

The BOP/Recycling Center is also known as the former Household Hazardous Waste Drop-off Facility, located south and across Carl Road from the main plant site at the proposed location of the Administration Building shown on Figure 3-5. In August 2001, one 2,000-gallon waste oil underground storage tank was removed from this site. While the tank condition was reportedly excellent, discharge was noted as a possible result of overspill or unknown reasons. Soil sampling detected residual petroleum hydrocarbons of up to 320 ppm TPH as diesel; 2.7 ppm TPH-gasoline; 250 ppm TPH-oil and grease; and no benzene, toluene, ethylbenzene, xylenes, or oxygenated volatile organic compounds. The case closure letter indicated that the residual contamination in soil poses no significant impact to human health, safety or the environment with current site use; however, it could pose an unacceptable risk during grading or excavation. The Santa Clara County Department of Environmental Health (SCCDEH) should be notified prior to any changes in land use, grading or excavation (SCCDEH, 2005).

**City of Sunnyvale Landfill**

The City of Sunnyvale Landfill is a closed Class III Landfill that was used for disposal of non-hazardous residential, commercial, and industrial municipal solid waste and construction debris until 1993. Waste disposal activities purportedly began in the 1920’s. No liner was installed below the waste material prior to placement. The closed landfill surrounds the landward sides of the main plant. Landfill closure included a minimum four-foot thick final cover system, including at least one-foot thick low permeability soil layer (SCS Engineers, 2012a). A surface water drainage system helps minimize the infiltration of rain water by conveyance of runoff along drainage
ditches installed along the landfill access roads. Drain pipes and catch basins installed at low points manage the drainage at the landfill. A landfill gas collection and control system conveys landfill gas to the WPCP’s power generation facility or the landfill’s gas flare. Maintenance and monitoring of the closed landfill are regulated in part under RWQCB Waste Discharge Requirements (WDRs) Order No. R2-2004-0030, described in Section 4.9, Hydrology, and below in Section 4.11.2.2.

Condensate generated from the landfill gas collection system is pre-treated via the Condensate Pre-Treatment System (CPTS) prior to discharge to the WPCP’s headworks. Leachate from the landfill, and some condensate associated with periodic CPTS cleanings, were historically discharged to the South Bayside System Authority (now known as Silicon Valley Clean Water [SVCW]) Waste Water Treatment Plant in Redwood City because the discharge periodically contained levels of constituents that precluded discharge to the WPCP (RWQCB, 2004). As a result of physical modifications to the SVCW plant, this waste stream could no longer be received at the SVCW Plant. An alternative means of disposition is currently being sought. Periodic leachate extraction continues, and leachate elevations remain at approximate groundwater elevations. Shallow local groundwater continues to generally flow radially toward the center of the landfill, while being prevented from flowing from the landfill into deeper groundwater by an aquitard (RWQCB, 2004). Thirty-two groundwater monitoring wells are used to monitor groundwater elevation and/or chemical concentrations. In accordance with the landfills WDRs, a corrective action program based on hydraulic capture of groundwater by sanitary sewer and storm drain pipelines and channels continues to be in effect (SCS Engineers, 2012b). Monitoring results from the monitoring and observation wells indicate that impacted groundwater remains contained within the footprint of the landfill, and groundwater monitoring indicates that the landfill may be affected by VOCs originating from upgradient offsite sources. Analytical results of samples collected from leachate monitoring wells indicate that some of the contaminants detected in the groundwater do originate from landfill waste. Ongoing surface water monitoring indicates no substantial impacts from drainage to surface waters tributary to Guadalupe Slough and San Francisco Bay.

The proposed Administration Building is within the boundary of the historic landfill area. As part of a geotechnical study for the Master Plan, several borings were advanced at the site of the Administration Building. These borings encountered a layer of landfill refuse consisting of domestic waste, wood, glass, organic materials, concrete, and paper mixed with clay. The fill layer is about 9 to 14 feet thick (Fugro, 2015).

**WPF**

Database searches identified 103 sites within one half-mile of the well injection area and recharge basins. The potential for soil and groundwater contamination is generally considered low unless there is a documented release, in which case the site would also be listed in the environmental databases as an environmental case or spill site. A UST site qualifies to receive a “No Further Action” (closure) letter once the owner or operator meets all appropriate corrective action requirements. Of the site located within one half-mile of the well injection area, 88 cases are closed.
Numerous permitted hazardous materials sites occur between the WPCP and the WPF, where the purified water pipelines may be installed. Table 4.11-2 and Figures 4.11-1 and 4.11-2 identify the listed open cleanup cases within one half-mile of the injection well area and recharge basins. Individual sites discussed below are highlighted due to the potential for contamination from these facilities to affect subsurface conditions within the WPF well injection and recharge basin areas.

**Pacific Aerospace Services**

The Pacific Aerospace facility is located near one of the Los Gatos Recharge Basins. The site operated as a plating facility for aircraft parts. Regulatory involvement at the site includes federal, state and local agencies associated with the assessment and removal of wastes from the site after a fire in 2005. The facility ceased operations after the fire. Subsequent soil and groundwater investigations detected acetone, trichloroethylene, styrene, and nickel in soils beneath the site. Contaminants were not detected in groundwater beneath the site and no additional investigation was performed (Weston Solutions, Inc., 2008).

**Orchard Farm Shopping Center**

The Orchard Farm Shopping Center site is located in the northern portion of the well injection area, near the intersection of Miller Avenue and Bollinger Road in San José. The Shopping Center began operating in 1969. Site investigations conducted in 1989 identified perchloroethylene (also known as PCE, perc, or tetrachloroethene) in soil at the site, believed to be from a dry cleaning facility in operation at the Shopping Center from the early 1970s to 1989. The top seven feet of soil in the affected area was excavated as part of a removal action in 1991. Subsequent sampling detected PCE in soil at or below 10 feet below ground surface. Consequently, a Deed Restriction requiring the owner to give 30 day written notice prior to soil disturbance at or below 9 feet bgs was recorded for the site (Jemison, 2015).

Although no specific sites will be identified until engineering feasibility studies are completed, preliminary land uses of sites considered to date include open space, parks, public-use (i.e., schools), and residential parcels. The Orchard Farm Shopping Center is a commercial parcel.

**Sedgwick Elementary School Expansion Project**

The planned Sedgwick Elementary School Expansion Project is located approximately 0.5-mile north of the well injection area, near the intersection of Finch Avenue and Phil Lane in City of Cupertino. Although historical information indicates that previous uses of the site were orchards and residences, a 500-gallon LUST was removed from the site in 1996 (Cornerstone Earth Group, 2014). While a case closure letter was submitted by the Santa Clara Valley Water District (District) in 1997, recent site characterization associated with the planned use of the site for school expansion identified lead, chlordane, TPH from gasoline, ethylbenzene, and xylenes at concentrations exceeding their residential screening levels at depths of approximately 13 feet bgs (Cornerstone Earth Group, 2014). A Preliminary Environmental Assessment Workplan to determine whether a release or potential release of hazardous substances, which pose a threat to human health via ingestion, dermal contact, and inhalation exposure pathways, exists at the site,
has been approved by the DTSC (DTSC, 2015b). Recommendations based on the Environmental Assessment would be designed to reduce the risk of contaminant migration.

Dean’s Goodyear
Dean’s Goodyear is located at 5291 Prospect Road in San José, near the intersection of Prospect Road with Saratoga Avenue. Records indicate that a release of diesel was identified at the site during a tank closure in 1992. The case is currently under investigation by the RWQCB and no known remedial actions have been taken at the site (SWRCB, 2015).

Chevron #9-1325
The Chevron #9-1325 station is located at 1704 Saratoga Avenue, near the intersection of Saratoga Avenue and Prospect Road. The site is currently an active gasoline station. In 1998, one 1,000-gallon used oil UST was removed from the site. Petroleum hydrocarbons and methyl tert butyl ether (MTBE), a gasoline additive, were detected in the groundwater at the site in a grab groundwater sample taken in 2003. In 2004, three 10,000-gallon underground storage tanks were removed from the site, along with petroleum hydrocarbon-contaminated soil (SAIC, 2013). Since 2007, multiple additional remediation efforts have been conducted to limit the extent of soil and groundwater contamination, including free product (petroleum hydrocarbon product not mixed with water) removal, soil vapor extraction, and in situ physical and chemical treatment. Current and historical groundwater flow information at the site indicates that groundwater generally flows east southeast from the Chevron station (SAIC, 2013). Monitoring wells are located onsite surrounding the locations of the removed USTs, as well as offsite to the east and southeast (SAIC, 2013). Petroleum hydrocarbon plumes have been detected approximately 30 and 60 feet below ground surface (SAIC, 2013). Contamination from the Chevron site has not been detected in significant levels in groundwater downgradient and offsite (SAIC, 2013). However, the site has not been closed by the RWQCB due to the appearance of free product in onsite wells from 2007 to 2014 (Leidos Engineering, 2015). Chevron is scheduled to present a work plan for additional remedial efforts to the SCCDEH in October 2015 (SCCDEH, 2015a).

Shell – 1804 Saratoga
The site is a former Shell service station located at 1804 Saratoga Avenue, near the intersection of Saratoga Avenue and Quito Road/Lawrence Expressway. Petroleum hydrocarbons were discovered to be leaking from underground storage tanks at the site in 1995 (Conestoga-Rovers and Associates, 2011). A subsequent subsurface investigation identified petroleum hydrocarbons in soil and groundwater at the site. Three 18,000-gallon USTs, with associated dispensers and piping, were removed from the site in 2009, and soil was overexcavated from the site. Groundwater at the site occurs at approximately 60-90 feet bgs and flows to the northeast (Conestoga-Rovers and Associates, 2013). Plumes of petroleum hydrocarbons, benzene, MTBE, and tertiary-butyl alcohol are present at the site, but are less than 1,000 feet long (Conestoga-Rovers and Associates, 2013). The MTBE plume extends the farthest from the site, approximately 400 feet across Quito Road (Conestoga-Rovers and Associates, 2013). Pending the SCCDEH’s receipt of a report documenting the destruction of monitoring wells at the site, the site is
4. Environmental Setting, Impacts, and Mitigation Measures

4.11 Hazards and Hazardous Materials

Currently eligible for closure due to the lack of free product, reduced contaminant concentrations, and reduced plume length (SCCDEH, 2015b).

4.11.1.5 Wildfire Hazards

Areas identified as Wildland Urban Interface are either within a geographic area identified by the State of California as a Fire Hazard Severity Zone or within another area designated by Santa Clara County to be at a significant risk from wildfires. Based upon fire hazard mapping by CAL FIRE and Santa Clara County, the WPCP and the WPF are not located within identified high fire hazard areas (Santa Clara County, 2015).

4.11.1.6 Airports

The nearest airports or airstrips to the WPCP and the WPF are Moffett Federal Airfield in Mountain View, Norman Y. Mineta San José International Airport in San José, and Palo Alto Airport of Santa Clara County in Palo Alto (Airnav, 2015). Both San José International Airport and Palo Alto Airport are located more than five miles from the WPCP and the WPF. Moffett Federal Airfield is located approximately 1.75 miles west of the WPCP. The WPCP is located outside of Moffett Federal Airfield’s noise contour and approach zone, and the proposed structures would be well below the airport’s height restriction area. The maximum allowable structure height in the WPCP vicinity is 182 feet (Santa Clara County Airport Land Use Commission, 2012).

4.11.1.7 Schools

As described in Section 4.12, Public Services, the city of Sunnyvale contains twelve public elementary schools, four public middle schools and one public high school. In addition, there are nine private schools within the city of Sunnyvale. There are no existing or proposed schools within one quarter-mile of the WPCP.

There are 16 public schools within one quarter-mile of the well injection area and recharge basins. Within the well injection area, Grovecenter Elementary, Covina High, and San Francisco Christian Academy are the only schools within one quarter-mile of a hazardous materials site (California Department of Education, 2015).

4.11.1.8 Emergency Response

The Santa Clara County Operational Area Emergency Operations Plan establishes emergency organization, assigns tasks, specifies policies and general procedures, and provides for coordination of response in the event of an emergency. The plan does not identify specific emergency response or evacuation routes (Santa Clara County, 2008).
4.11.2 Regulatory Setting

4.11.2.1 Federal Regulations

*Comprehensive Environmental Response and Liability Act. Superfund Amendments and Reauthorization Act of 1986 (42 USC Section 9601 et seq.)*

The Superfund Amendments and Reauthorization Act amended Superfund to increase state involvement and required Superfund actions to consider state environmental laws and regulations. SARA also established a regulatory program for the Emergency Planning and Community Right-to-Know Act. The applicable part of SARA for the Master Plan is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986. Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous substances present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous substances. Key provisions require notification when extremely hazardous substances are present above their threshold planning quantities; immediate notification to the local emergency planning committee and the state emergency response commission when a hazardous material is released in excess of its reportable quantity; and that material safety data sheets for all hazardous materials or a list of all hazardous materials be submitted to the state and local emergency planning agencies and local fire department.

*Resources Conservation and Recovery Act (RCRA; 42 USC 6901 et seq.)*

RCRA is the principal law governing the management and disposal of hazardous materials. RCRA is considered a “cradle to grave” statute for hazardous wastes in that it addresses all aspects of hazardous materials from creation to disposal. RCRA applies to this program because RCRA is used to define hazardous materials; offsite disposal facilities and the wastes each may accept are regulated under RCRA.

*Clean Air Act (42 USC 7401 et seq. as amended)*

Regulations under the Clean Air Act are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a threshold quantity or greater of listed regulated substances to develop a risk management plan, including hazard assessments and response programs to prevent accidental releases of listed chemicals.

*Toxic Substances Control Act (15 USC 2605)/Resource Conservation and Recovery Act (42 USC 6901 et seq.)/Hazardous and Solid Waste Act*

The federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 established a program administered by the U.S. EPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. The Resource Conservation and Recovery Act was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the “cradle to grave” system of regulating hazardous wastes.
4. Environmental Setting, Impacts, and Mitigation Measures
4.11 Hazards and Hazardous Materials

U.S. Department of Transportation Hazardous Materials Transport Act (49 USC 5101)

The U.S. Department of Transportation, in conjunction with the U.S. EPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 directs the U.S. Department of Transportation to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. Code of Federal Regulations (CFR) 49, 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials.

Occupational Safety and Health Administration, Title 29 CFR 1910

The Occupational Safety and Health Administration’s (OSHA’s) mission is to ensure the safety and health of America’s workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. The OSHA staff establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs.

National Fire Protection Association Standards

The National Fire Protection Association develops and publishes consensus codes and standards intended to minimize the possibility and effects of fire and other risks. While not regulations, these codes and standards are industry-accepted guidelines for construction and fire protection systems. National Fire Protection Association Code 820 establishes the standard for fire protection in waste water treatment and collection facilities, which would be applicable to digester gas storage facilities. Additional relevant codes include a fuel gas code, standard on explosion prevention systems, standards for fire prevention during welding, etc.

4.11.2.2 State Regulations

California Code of Regulations, Title 22, Section 64572, Water Mains

California Code of Regulations (CCR), Title 22, Section 64572 states that new water mains and supply lines shall not be within the same trench as, and must be located least 10 feet horizontally from, any parallel pipeline conveying sewage, secondary-treated recycled water, and hazardous fluids such as fuels, industrial wastes, and wastewater sludge. In addition, new water mains may not be installed within 100 horizontal feet of any sanitary landfill, wastewater disposal pond, or hazardous waste disposal site, or within 25 horizontal feet of the nearest edge of any cesspool, septic tank, sewage leach field, underground hazardous material storage tank, or groundwater recharge site.

CCR, Title 27, Division 2, Combined SWRCB/CIWMB Regulations for Solid Waste

These regulations provide criteria for all waste management units, facilities, and disposal sites, including landfill siting and design, construction standards, landfill gas and water monitoring requirements, closure and post-closure maintenance standards.
Health and Safety Code, Section 25249.5 et seq. Safe Drinking Water and Toxics Enforcement Act, Proposition 65

This law identifies chemicals that cause cancer and reproductive toxicity, provides information for the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. Businesses are required to notify Californians about the chemicals in products they purchase, in the workplace, or that are released to the environment. By providing this information, individuals are able to make informed decisions about protecting themselves from exposure to these chemicals.

Health and Safety Code, Section 25270, Aboveground Petroleum Storage Act

Health and Safety Code Sections 25270 to 25270.13 ensure compliance with the federal Clean Water Act. The law applies to facilities that operate a petroleum aboveground storage tank with a capacity greater than 660 gallons or combined aboveground storage tanks capacity greater than 1,320 gallons or oil-filled equipment where there is a reasonable possibility that the tank(s) or equipment may discharge oil in “harmful quantities” into navigable waters or adjoining shore lands. If a facility falls under these criteria, it must prepare a Spill Prevention Control and Countermeasure Plan.

Health and Safety Code, Section 25500 et seq.

This code and the related regulations in 19 CCR 2620, et seq., require local governments to regulate local business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit a Hazardous Materials Business Plan (HMBP) to their local Certified Unified Program Agency and to report releases to this agency and the State Office of Emergency Services.

Health and Safety Code, Section 25531 et seq.

This code and the California Accidental Release Program regulate the registration and handling of regulated substances. Regulated substances are any chemicals designated as an extremely hazardous substance by U.S. EPA as part of its implementation of SARA Title III. Health and Safety Code Section 25531 overlaps or duplicates some of the requirements of SARA and the Clean Air Act. Facilities handling or storing regulated substances at or above threshold reportable quantities must register with their local agency and prepare a risk management plan.

Hazardous Materials Release Response Plans and Inventory Act of 1985

The Hazardous Materials Release Response Plans and Inventory Act, also known as the Business Plan Act, requires businesses using hazardous materials to prepare a plan that describes their facilities, inventories, emergency response plans, and training programs. Business plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed.

3 California HSC Sections 25500-25519 or 20 HSC Chapter 6.95.
Hazardous Waste Control Act

The Hazardous Waste Control Act created the State hazardous waste management program, which is similar to but more stringent than the federal Resource Conservation and Recovery Act program. The act is implemented by regulations contained in Title 26 of the CCR, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling treatment, storage and disposal facilities; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

This program requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a Certified Unified Program Agency (CUPA). The following Program Elements are consolidated under the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program):

- Hazardous Waste Generator and Onsite Hazardous Waste Treatment Programs (a.k.a. Tiered Permitting)
- Aboveground Petroleum Storage Tanks
- Hazardous Materials Release Response Plans and Inventory Program (a.k.a. Hazardous Materials Disclosure or “Community-Right-To-Know”)
- California Accidental Release Prevention Program
- UST Program
- Uniform Fire Code Plans and Inventory Requirements

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more Program Elements in coordination with the CUPA.

Asbestos-Containing Materials

Prior to renovation or demolition of buildings containing asbestos, contractors licensed to conduct asbestos abatement work must be retained. Asbestos abatement contractors must follow state regulations contained in 8 CCR 1529, and 8 CCR 341.6 through 341.14 where there is

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4 California HSC Sections 25404-25404.9
asbestos-related work involving 100 square feet or more of asbestos containing material. The Bay Area Air Quality Management District (BAAQMD) and the California Occupational Safety and Health Administration (Cal/OSHA) must be notified ten days prior to initiating construction and demolition activities. Asbestos encountered during demolition of an existing building must be transported and disposed of at an appropriate facility. The contractor and hauler of the material are required to file a Hazardous Waste Manifest which details the hauling of the material from the site and the disposal of it. Section 19827.5 of the California Health and Safety Code, adopted January 1, 1991, requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos.

**PCBs**

In 1979, the U.S. EPA banned the use of PCBs in most new electrical equipment and began a program to phase out certain existing PCB-containing equipment. The use and management of PCBs in electrical equipment is regulated pursuant to the Toxic Substances Control Act, 15 USC § 2601 et seq. The Toxic Substances Control Act and its implementing regulations generally require labeling and periodic inspection of certain types of PCB equipment and set forth detailed safeguards to be followed for disposal of such items.

**Lead and LBP**

Regulations to manage and control exposure to LBP are described in CFR Title 29, Section 1926.62 and CCR Title 8 Section 1532.1. These regulations cover the demolition, removal, cleanup, transportation, storage and disposal of lead-containing material. The regulations outline the permissible exposure limit, protective measures, monitoring and compliance to ensure the safety of construction workers exposed to lead-based materials. Cal/OSHA’s Lead in Construction Standard requires project proponents to develop and implement a lead compliance plan when LBP would be disturbed during construction. The plan must describe activities that could emit lead, methods for complying with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Cal/OSHA requires 24-hour notification if more than 100 square feet of LBP would be disturbed.

**Screening Levels for Hazardous Materials in Soil or Groundwater**

The RWQCB Environmental Screening Levels (ESLs) (RWQCB, 2013) are guidelines used to evaluate the potential risk associated with chemicals found in soil or groundwater where a release of hazardous materials has occurred. ESLs have been established for both residential and commercial/industrial land uses, and also for construction workers. Residential screening levels are the most restrictive; soil with chemical concentrations below these levels generally would not require remediation and would be suitable for unrestricted uses if disposed of offsite. Commercial/industrial screening levels are generally higher than residential screening levels because they are based on potential worker exposure to hazardous materials in the soil (and these are generally less than residential exposures). Screening levels for construction workers are also higher than for commercial/industrial workers because construction workers are only exposed to
the chemical of concern during the duration of construction, while industrial workers are assumed to be exposed over a working lifetime.

The Cal-EPA California Human Health Screening Levels are concentrations of 54 hazardous chemicals in soil or soil gas that Cal-EPA considers to be below thresholds of concern for risks to human health (Cal-EPA, 2005). These concentrations can be used to screen sites for potential human health concerns where releases of hazardous chemicals have occurred. The presence of a chemical at concentrations in excess of screening level does not indicate that adverse impacts are occurring or will occur, but suggests that further evaluation is warranted. These screening levels are guidance, and not regulatory cleanup standards.

**Waste Classification Criteria**

In accordance with Title 22 of the CCR Section 66261.20 et seq., excavated soil is classified as a hazardous waste if it exhibits the characteristics of ignitability, corrosivity, reactivity, and/or toxicity. A waste is considered toxic in accordance with 22 CCR 66261.24 if it contains:

- Total concentrations of certain substances at concentrations greater than the total threshold limit concentrations (TTLC);
- Soluble concentrations greater than the soluble threshold limit concentrations (STLC);
- Soluble concentrations of certain substances greater than federal toxicity regulatory levels using the Toxic Characteristic Leaching Procedure (TCLP); or
- Specified carcinogenic substances at a single or combined concentration of 0.001 percent.

State and federal regulations consider waste to be hazardous if the soluble concentration exceeds the federal regulatory level as determined by the TCLP. Because the TCLP involves a 20-to-1 dilution of the sample, the total concentration of a substance in the soil would need to exceed 20 times the regulatory level for the soluble concentration to exceed the regulatory level in the extract. A waste is also considered hazardous under state regulations if the soluble contaminant concentration exceeds the STLC as determined by the waste extraction test method. Because the waste extraction test analysis is performed using a 10-to-1 dilution of the sample, the total concentration of a substance would need to exceed 10 times the STLC for the soluble concentration to possibly exceed the STLC in the extract. A waste may also be classified as toxic if testing indicates toxicity greater than the specified criteria. Soil that is not classified as a hazardous waste can be accepted at a Class II or Class III designated landfill, depending on the waste acceptance criteria for the specific landfill.

**California Office of Emergency Services**

In order to protect the public health and safety and the environment, the California Office of Emergency Services is responsible for establishing and managing statewide standards for business and area plans relating to the handling and release or threatened release of hazardous materials. Basic information on hazardous materials handled, used, stored, or disposed of (including location, type, quantity, and the health risks) needs to be available to firefighters,
public safety officers, and regulatory agencies need to be included in business plans in order to prevent or mitigate the damage to the health and safety of persons and the environment from the release or threatened release of these materials into the workplace and environment. These regulations are covered under Chapter 6.95 of the California Health and Safety Code Article 1–Hazardous Materials Release Response and Inventory Program (Sections 25500 to 25520) and Article 2–Hazardous Materials Management (Sections 25531 to 25543.3).

**Utility Notification Requirements**

Title 8, §1541 of the CCR requires excavators to determine the approximate locations of subsurface installations such as sewer, telephone, fuel, electric, and water lines (or any other subsurface installations that may reasonably be encountered during excavation work) prior to opening an excavation. The California Government Code (§4216 et seq.) requires owners and operators of underground utilities to become members of and participate in a regional notification center. According to §4216.1, operators of subsurface installations who are members of, participate in, and share in the costs of a regional notification center are in compliance with this section of the code. Underground Services Alert of Northern California (known as USA North) receives planned excavation reports from public and private excavators and transmits those reports to all participating members of USA North that may have underground facilities at the location of excavation. Members will mark or stake their facilities, provide information, or give clearance to dig (USANorth, 2012).

**California Public Resources Code Fire Safety Regulations**

The California Public Resources Code (PRC) includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that use an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas. These regulations include the following.

- Earthmoving and portable equipment with internal combustion engines would be equipped with a spark arrestor to reduce the potential for igniting a wildland fire (PRC Section 4442).
- Appropriate fire suppression equipment would be maintained during the highest fire danger period—from April 1 to December 1 (PRC Section 4428).
- On days when a burning permit is required, flammable materials would be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor would maintain the appropriate fire suppression equipment (PRC Section 4427).

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5 A spark arrestor is a device that prohibits exhaust gases from an internal combustion engine from passing through the impeller blades where they could cause a spark. A carbon trap is commonly used to retain carbon particles from the exhaust.
• On days when a burning permit is required, portable tools powered by gasoline-fueled internal combustion engines would not be used within 25 feet of any flammable materials (PRC Section 4431).

**Uniform Fire Code**

The California Fire Code includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals, and specify the following specific design features to reduce the potential for a release of hazardous materials that could affect public health or the environment.

• Separation of incompatible materials with a noncombustible partition, or appropriate distance separation.

• Spill control in all storage, handling, and dispensing areas.

• Separate secondary containment for each chemical storage system. The secondary containment must hold the entire contents of the tank, plus the volume of water needed to supply the fire suppression system for a period of 20 minutes in the event of a catastrophic spill.

**Cal/OSHA**

Cal/OSHA is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

**California Highway Patrol**

A valid Hazardous Materials Transportation License, issued by the California Highway Patrol, is required by the laws and regulations of State of California Vehicle Code Section 3200.5 for transportation of hazardous materials shipments for which the display of placards is required by State regulations; or hazardous materials shipments of more than 500 pounds, which would require placards if shipping greater amounts in the same manner.

Additional requirements on the transportation of explosives, inhalation hazards, and radioactive materials are enforced by the California Highway Patrol under the authority of the State Vehicle Code. Transportation of explosives generally requires consistency with additional rules and regulations for routing, safe stopping distances, and inspection stops (Title 14, CCR, Chapter 6, Article 1, Sections 1150-1152.10). Inhalation hazards face similar, more restrictive rules and regulations (Title 13, CCR, Chapter 6, Article 2.5, Sections 1157-1157.8).
California RWQCB, San Francisco Bay Region, Order R2-2014-0035, NPDES Permit No. CA0037621

The Sunnyvale WPCP is regulated under the waste discharge requirements set forth in RWQCB Order R2-2014-0035, National Pollutant Discharge Elimination System (NPDES) Permit No. CA0037621 (RWQCB, 2014). This permit regulates the discharge of treated wastewater by the WPCP into Moffett Channel, which flows into the Guadalupe Slough, and then San Francisco Bay. The Permit places limitations on the quantities of conventional pollutants (e.g., ammonia, suspended solids, oil and grease, turbidity, biological oxygen demand) and special pollutants of concern (e.g., copper, cyanide, mercury, and nickel) that are present in the WPCP’s treated effluent. The permit also specifies testing, monitoring and reporting protocols to ensure that treated effluent meets permit requirements. The WPCP provides compliance reports to the RWQCB on a regular basis to demonstrate its compliance with permit provisions. For additional information, refer to Section 4.10, Water Quality.

California RWQCB, San Francisco Bay Region, Sunnyvale Landfill Waste Discharge Requirements Order R2-2004-0030

RWQCB Waste Discharge Requirements Order No. R2-2004-0030 contains provisions, specifications, and prohibitions for the maintenance and monitoring of the landfill. As required by the Order, the existing containment, drainage, and monitoring systems at the facility shall be maintained as long as leachate is present and poses a threat to water quality. Any proposed material changes in site operations or features would need to be approved by the RWQCB to ensure the integrity of the landfill cap and prevention of water quality impacts (RWQCB, 2004).

4.11.2.3 Local Policies

Sunnyvale Department of Public Safety

The Sunnyvale Department of Public Safety, Hazardous Materials Compliance Unit is the local CUPA agency for the City of Sunnyvale (City of Sunnyvale, 2015). It is responsible for the following programs under the State’s Unified Program:

- Hazardous Materials Business Plans
- Hazardous Waste Generator Inspection
- Hazardous Waste Tiered Permitting
- Underground Storage Tank Permitting and Inspection
- Aboveground Tank Storage
- California Accidental Release Prevention Plans

In addition, the Department implements local ordinances regulating hazardous materials storage and the safe use and storage of toxic gases. A consolidated Fire Prevention and Hazardous Materials Permit is issued to a Sunnyvale business after submittal of an approved application, a field inspection to confirm compliance, and payment of applicable fees.
Sunnyvale Stormwater Ordinance (Chapter 12.60)
The City requires a Stormwater Management Plan for all projects when they create or replace 10,000 square feet or more of impervious service. The plan must detail the specific construction BMPs for stormwater runoff. Projects that will increase impervious surface by more than 50 percent are subject to stormwater treatment measures for the entire project.

Santa Clara County Operational Area Emergency Operations Plan
The Santa Clara County Emergency Operations Plan is intended to ensure the most effective allocation of resources for the maximum benefit and protection of the population during times of emergency. The plan establishes emergency organization, assigns tasks, specifies policies and general procedures and provides for coordination of planning efforts for respective staff. The plan does not designate emergency response or evacuation routes (Santa Clara County, 2008).

Santa Clara County Grading Ordinance (Title C, Division C12, Chapter 3)
All construction and demolition projects must comply with the County’s grading ordinance, which requires the use of erosion and sediment controls. For any grading activity that occurs during the rainy season, an Erosion Control Plan detailing BMPs that will prevent discharge of stormwater pollutants must be submitted to the Development Services offices. The county regularly inspections construction sites to ensure the development projects are properly implementing water quality BMPs.

4.11.3 Impacts and Mitigation Measures

4.11.3.1 Thresholds of Significance
For the purposes of this EIR, an impact related to hazards and hazardous materials is considered significant if implementation of the proposed project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;
• For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area;

• Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or

• Expose people or structures to a significant risk of loss, injury, or death involving wildfires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

4.11.3.2 Approach to Analysis

This analysis focuses on the potential to encounter hazardous substances in soil and groundwater during construction and is based on the regulatory database searches and review of site investigation and environmental sampling reports discussed in Section 4.11.1. The analysis also addresses the potential for the Master Plan and the WPF to release hazardous materials during construction and operation, interfere with an adopted emergency response plan or emergency evacuation plan, and create fire hazards. Each potential impact is assessed in terms of the applicable regulatory requirements, and mitigation measures are identified as appropriate. The Master Plan impacts are analyzed in Section 4.11.3.4 and the WPF impacts are analyzed in Section 4.11.3.5.

Due to the nature of the Master Plan and WPF, there would be no impacts related to the following criterion; therefore, no impact discussion is provided for this impact for the reasons described below.

Threshold of Significance: Would the project expose people or structures to a significant risk of loss, injury, or death involving wildfires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The WPCP and WPF are not located in areas identified as Wildland Urban Interface areas; therefore, this criterion is not applicable to the Master Plan or WPF.

There would be no impacts resulting from the Master Plan without the WPF for the following criterion, and no discussion is provided below in Section 4.11.3.4, Master Plan Impacts and Mitigation Measures.

Threshold of Significance: Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

As indicated above in Section 4.11.1.6, Schools, there are no schools within one quarter-mile of the WPCP; therefore, this criterion is not applicable to the Master Plan.

4.11.3.3 Impact Summary

Table 4.11-4 lists the project’s hazard and hazardous materials impacts and significance determinations.
### TABLE 4.11-4
**SUMMARY OF IMPACTS – HAZARDS AND HAZARDOUS MATERIALS**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Master Plan</th>
<th>Water Purification Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAZ-1: Routine transport, use, or disposal of hazardous materials during operations</td>
<td>LS</td>
<td>LS</td>
</tr>
<tr>
<td>HAZ-2: Reasonably Foreseeable Upset and Accident Conditions during construction</td>
<td>LSM</td>
<td>LSM</td>
</tr>
<tr>
<td>HAZ-3: Located on a Site Listed Pursuant to Government Code Section 65962.5</td>
<td>LSM</td>
<td>LSM</td>
</tr>
<tr>
<td>HAZ-4: Within Two Miles of a Public Airport or Private Airstrip</td>
<td>LS</td>
<td>LSM</td>
</tr>
<tr>
<td>HAZ-5: Impair Emergency Response or Evacuation Plans</td>
<td>LSM</td>
<td>LSM</td>
</tr>
<tr>
<td>HAZ-6: Hazardous Emissions Near Schools</td>
<td>N/A</td>
<td>LS</td>
</tr>
</tbody>
</table>

**Notes:**
- **LS** = Less than Significant impact, no mitigation required
- **LSM** = Less than Significant impact with Mitigation
- **N/A** = Not applicable
4.11.3.4 Master Plan Impacts and Mitigation Measures

Impact HAZ-1: Project operation would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, a less-than-significant impact.

The proposed improvements to the WPCP are described in Section 3.4, Water Pollution Control Plant Improvements. Table 4.11-5 summarizes the proposed future WPCP chemical usage:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Usage (gal/year)</th>
<th>Container Type and Volume (gallons)</th>
<th>Frequency (per month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>513,540</td>
<td>Bulk (4,500)</td>
<td>10</td>
</tr>
<tr>
<td>Sodium bisulfite</td>
<td>176,210</td>
<td>Bulk (4,500)</td>
<td>4</td>
</tr>
<tr>
<td>Ferric Chloride</td>
<td>290,100</td>
<td>Bulk (4,500)</td>
<td>6</td>
</tr>
<tr>
<td>Polymer – DMF</td>
<td>27,180</td>
<td>Tote (275)</td>
<td>9</td>
</tr>
<tr>
<td>Polymer – AFT</td>
<td>129,840</td>
<td>Bulk (4,500)</td>
<td>3</td>
</tr>
<tr>
<td>Polymer – Thickening</td>
<td>19,170</td>
<td>Tote (275)</td>
<td>6</td>
</tr>
<tr>
<td>Polymer - Dewatering</td>
<td>62,940</td>
<td>Bulk (4,500)</td>
<td>2</td>
</tr>
</tbody>
</table>

SOURCE: City of Sunnyvale, 2015

The uses of the chemicals listed above in Table 4.11-5 are as described below.

- Sodium hypochlorite (12.5% solution) would continue to be used to disinfect the treated water prior to discharge to Moffett Channel or use for recycled water. The sodium hypochlorite would be stored in tanks, as stated in Section 4.11.1.2. Human exposure to sodium hypochlorite can cause severe skin burns and eye damage. Sodium hypochlorite is also very toxic to aquatic life (NCBI, 2015a).

- Liquid sodium bisulfite would continue be used at the WPCP to dechlorinate recycled water and the Number 3 water stream (EOA, 2008). Sodium bisulfite would continue to be stored in one storage tank in south of the chlorine contact tanks. Sodium bisulfite is corrosive and a skin irritant (NCBI, 2015b).

- Ferric chloride would be used as a flocculant in sewage treatment. Ferric chloride is an orange to brown-black solid. It is slightly soluble in water and is noncombustible. When wet, it is corrosive to aluminum and most metals. Inhalation of dust may irritate nose and throat. Ingestion causes irritation of mouth and stomach. Dust irritates eyes. Prolonged contact with skin causes irritation and burns (NCBI, 2015c).

- Polymer DMF, a proprietary organic material, would continue to be used for filtration processes. Polymers are large organic molecules used to coagulate suspended solids and produce large curds of solid materials (floc) (Chemco, undated). The chemical composition is typically proprietary.
• Polymer AFT, a proprietary organic material, would continue to be used in the AFTs.

• Other Polymers – Other proprietary polymers would continue to be used for sludge thickening and to enhance sludge dewatering.

Much of the chemical usage in the treatment processes under the Master Plan would remain similar to current operations. The specific changes in the treatment of waste water are as discussed below.

**Secondary Treatment**

The proposed change would convert the secondary treatment process to the use of a conventional activated sludge, as described in Section 3.4.3, Secondary Treatment. Similar to the existing secondary treatment system, the process would use confined basins, closed containers, and pipelines to entirely contain the waste water in a closed system.

To meet anticipated future total phosphorus limitations, the Master Plan also includes provisions for phosphorus removal from treated effluent by either of two processes, described in Chapter 3, *Project Description*. The Chemical Phosphorous Removal facility would include a chemical storage tank and associated pipes. The chemical dosing process to remove phosphorous would likely use chemicals such as an aluminum coagulant and proprietary polymers (U.S. EPA, 2007). Sunnyvale may alternatively implement phosphorus removal using a biological approach, which would not require the use of hazardous materials.

**Tertiary Treatment**

The current tertiary treatment system takes the secondary treated effluent, passes the effluent through filters with the liquid continuing for chlorine disinfection and the filter backwash routed through oxidation ponds and then back into the beginning of the secondary effluent stream. Changes involving hazardous materials are discussed below.

Conversion to conventional activated sludge with chlorine disinfection has the potential to increase the amount of disinfectant byproducts such as trihalomethanes\(^6\) (THMs) in the WPCP effluent. To meet future THM regulations, the existing disinfection process would be replaced with chloramine\(^7\) or ultraviolet (UV)\(^8\) disinfection, as described in Section 3.4.4, Tertiary Treatment and Water Recycling. If chloramine disinfection is implemented, a tank for aqueous ammonia storage and associated piping would be installed to deliver ammonia to the chlorine contact tanks. The use of UV disinfection would not require the use of hazardous materials.

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\(^6\) Trihalomethanes are chemical byproducts of the disinfection process that have been linked to adverse health effects and include chloroform, bromoform, dichlorobromomethane, chlorodibromomethane. Trihalomethanes form when organic matter in water reacts with chlorine.

\(^7\) Chloramines are derivatives of ammonia by substitution of one, two or three hydrogen atoms with chlorine atoms.

\(^8\) Ultraviolet disinfection is a physical (rather than chemical) process used to inactivate or destroy pathogenic organisms. Ultraviolet disinfection systems transfer electromagnetic energy from a mercury arc lamp to an organism’s genetic material, thereby destroying a cell’s ability to reproduce.
In addition to the previously mentioned disinfection systems, if the SWRCB implements limits for constituents of emerging concern\(^9\), an ozone disinfection facility may be required to inactivate or destroy pathogenic organisms and to oxidize odor-causing compounds, as described in Section 3.4.4, Tertiary Treatment and Water Recycling. The air or liquid oxygen used to generate the ozone would be stored in pressurized gas cylinders or tanks. Although air or oxygen would not be considered a hazardous chemical, the gases would be stored under pressure and would represent a physical hazard due to that pressure.

As described in Table 4.11-5, future chemical usage estimates reflect increases commensurate with wastewater flow increases and changes in treatment processes. Existing uses of hazardous materials such as fuels and lubricants for routine maintenance of vehicles and equipment would continue.

As required by law, the WPCP has a HMBP that outlines hazardous materials storage and handling, emergency response and notification procedures, and employee health and safety training requirements. The City would update its existing HMBP to incorporate additional hazardous materials to be utilized under the Master Plan. The updated HMBP would be submitted to the local CUPA, the Sunnyvale Department of Public Safety, Hazardous Materials Compliance Unit. All chemical storage and handling systems would be designed and constructed in accordance with specific requirements for the safe storage and handling of hazardous materials set forth in the California Fire Code. Some of the requirements specifically applicable to the project include spill control in all storage, handling and dispensing areas, separate secondary containment for each chemical storage system, and separation of incompatible materials with a non-combustible partition or appropriate distance separation. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible materials that could pose a public health or water quality risk.

In addition, the HMBP would include an emergency response/contingency plan specifying procedures to contain a release or threatened release of hazardous materials, as well as required training for employees involved in hazardous materials handling. The HMBP would also provide local agencies with the information they need to plan appropriately for a chemical release, fire, or other incident.

All hazardous materials and wastes would be transported in compliance with federal and state regulations regarding the transport of hazardous materials, including the requirements of the California Highway Patrol and Caltrans. These requirements specify driver training requirements, load labeling procedures, and container specifications. Compliance with these regulations would reduce the potential for releases during routine transport.

**Mitigation:** None required.

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\(^9\) Chemicals in water that may pose a risk to human health and the environment but the presence, frequency of occurrence, or source of which may not be fully known.
Impact HAZ-2: Project construction activities could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, a less-than-significant impact with mitigation.

Implementation of the Master Plan would include the demolition of buildings and supporting structures containing unknown amounts of hazardous materials including LBP, ACM, and/or PCBs. The demolition and construction activities would include the use of hazardous materials including fuels, lubricants, solvents, adhesives, paint, thinners, or other chemicals. Implementation of the Master Plan would also include soil disturbance and grading at the existing main plant site, along the berm east of Cargill Channel, and potentially in Pond 1 and adjacent to the Sunnyvale Landfill, which could result in encountering hazardous materials in soil or groundwater. These construction activities could result in releases of hazardous materials into the environment, as discussed below.

Use of Hazardous Materials for Construction

The proposed demolition and construction equipment (such as trucks, cranes, bulldozers, excavators) would require the use of fuels (gasoline or diesel) and lubricants (hydraulic fluids, oils and greases). The construction activities would involve the use of adhesives, solvents, paints, thinners, and other chemicals. Cal/OSHA regulations provide for the proper labeling, storage, and handling of hazardous materials to reduce the potential harmful health effects that could result from worker exposure to hazardous materials. If not properly handled; however, accidental release of these substances could expose construction workers, degrade soils, or become entrained in stormwater runoff, resulting in adverse effects on the public or the environment.

As discussed under Impact HYD-1 in Section 4.9, Hydrology, all stormwater runoff within the main plant would be collected within the WPCP storm drainage system, which is routed to the headworks for treatment. Consequently, spills or leaks of construction chemicals that could occur within this area would be contained and would not result in adverse impacts off site.

Construction of WPCP improvements outside of the main plant site would together result in the disturbance of one acre or more and thus would be required to obtain coverage for construction stormwater discharges under the Construction General Permit and provide evidence of compliance to the City of Sunnyvale. Adherence to the Construction General Permit would require preparation of a SWPPP outlining construction BMPs related to housekeeping (storage of construction materials, waste management, vehicle storage and maintenance, pollutant control); non-stormwater management; erosion and sediment control; and run-on run-off control. Implementation of the SWPPP would reduce the potential impact related to the discharge of potential water quality pollutants associated with construction activities to a less-than-significant level.

With compliance with construction water quality regulations, potential adverse effects related to reasonably foreseeable upset and accident conditions involving the release of hazardous construction chemicals into the environment would be less than significant.
**Hazardous Building Materials**

Based on the age of existing facilities, the proposed demolition of structures may encounter hazardous building materials, such as asbestos-containing materials, LBP, PCBs, Bis (2-ethylhexyl phthalate (DEHP), and mercury. Electrical equipment may contain PCBs, while fluorescent light ballasts may contain PCBs or DEHP, and fluorescent light tubes generally contain mercury vapors. If present, and without proper abatement procedures, demolition/removal could expose workers and the environment to these hazardous building materials.

Section 19827.5 of the *California Health and Safety Code* requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos. The BAAQMD is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement, and must be notified ten days in advance of any proposed demolition or abatement work. The local office of Cal/OSHA must be notified of asbestos abatement to be carried out. Asbestos abatement contractors must follow state regulations contained in 8CCR1529 and 8CCR341.6 through 341.17 where there is asbestos-related work involving 100 square feet or more of asbestos-containing material. Asbestos removal contractors must be certified as such by the Contractors Licensing Board of the State of California. The owner of the property where abatement is to occur must have a Hazardous Waste Generator Number assigned by and registered with the Office of the California Department of Health Services in Sacramento. The contractor and hauler of the material are required to file a Hazardous Waste Manifest which details the hauling of the material from the site and the disposal of it. Pursuant to California law, the Sunnyvale Building Department would not issue the required permit until the applicant has complied with the notice and abatement requirements described above.

Demolition would also be subject to the Cal/OSHA Lead in Construction Standard (8 CCR Section 1532.1). This standard requires development and implementation of a lead compliance plan when materials containing lead would be disturbed during construction. The plan must describe activities that could emit lead, methods that will be used to comply with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Cal/OSHA would require 24-hour notification if more than 100 square feet of materials containing lead would be disturbed.

Other hazardous building materials that could be present include electrical transformers that could contain PCBs, fluorescent light ballasts that could contain PCBs or DEHP, and fluorescent light tubes that could contain mercury vapors. Disruption of these materials could pose health threats for construction workers if not properly disposed of, a potentially significant impact. However, implementation of Mitigation Measure M-HAZ-2a, Hazardous Building Materials Abatement, would require that the presence of such materials be evaluated prior to demolition or renovation and, if such materials were present, that they be properly handled during removal and building demolition or renovation. This would reduce the potential impacts of exposure to these hazardous building materials to a less-than-significant level.
Potential Soil and Groundwater Contamination

Sunnyvale Landfill and BOP/Recycling Center. Construction activities at the main plant site would occur adjacent to the closed Sunnyvale Landfill. Soil investigations within most of the main plant have not identified landfill wastes; however, a layer of landfill wastes underlies the proposed Administration Building (Fugro, 2015). Excavation and grading activities for construction could compromise the landfill cap and/or encounter waste and/or gases associated with the former landfill, as waste underlies the future Administration Building area (Fugro, 2015). Landfill gas typically consists of about 50 to 55 percent methane, 45 to 50 percent carbon dioxide, and one percent non-methane organic compounds and trace amounts of inorganic compounds (U.S. EPA, 2015). Methane gas is explosive, and hydrogen sulfide gas can be toxic. In addition, the BOP/Recycling Center (proposed site of the Administration Building) reportedly has residual levels of petroleum hydrocarbons (diesel, gasoline, and oil and grease).

The RWQCB has issued waste discharge requirements for the closed landfill in Order No. R2-2004-0030, as described above. As required by this Order, the City may not excavate within or reconfigure any existing waste management unit without prior RWQCB approval. The Order additionally requires that landfill gases be adequately vented, removed from the landfill, or otherwise controlled to minimize the danger of explosion or adverse health effects. Pursuant to this Order, 120 days before any material change in site operations or features, the City would be required to prepare and submit a technical report acceptable to the RWQCB, describing any material proposed changes to site development or redevelopment projects for the landfill. The report must describe the project, identify key changes to the design which may affect the landfill, and specify components of the design necessary to maintain integrity of the landfill cap. No material changes to the site may be made without approval by the RWQCB.

In addition, the City is required to comply with the California Title 27 Post-closure Land Use Regulations. Pursuant to these regulations, any proposed modification or replacement of the low permeability layer of the final cover cannot begin until approved by the local enforcement agency (in this case the SCCDEH) and the RWQCB.

Because any construction within the former landfill would require notification and approval by the RWQCB and SCCDEH, all work would be performed in accordance with the procedures and stipulations set forth by these agencies. These mandatory requirements would reduce potential adverse effects on the public or the environment that could otherwise result from exposure to landfill wastes and gases. Further, to ensure that any hazardous materials or wastes encountered are handled, transported and disposed of in a safe and lawful manner, Mitigation Measures HAZ-2b, Health and Safety Plan, and HAZ-2c, Soil and Groundwater Management Plan, are required to reduce these potential impacts to a less-than-significant level.

Main Plant and Oxidation Ponds. As discussed above in Section 4.11.1.2, soil sampling at the main plant indicated that all of the analytes except arsenic were below the ESL for construction/trench workers. Based on the concentrations detected, the soil is not considered a hazardous waste for disposal purposes (Carollo/HDR, 2014). Two of the sludge samples taken from the oxidation ponds in 2012 indicated the presence of metals. Arsenic, cadmium, copper,
molybdenum, zinc, and boron were detected at levels above the RWQCB ESLs (RWQCB, 2013; CalSciences, 2012). A site hazard investigation has not been conducted at the oxidation pond. The sludge is currently hauled offsite by Synagro to be used as Class B biosolids for land application, landfilling, or composting at up to seven permitted facilities, none of which accept hazardous materials.

In the absence of proper handling procedures, soil excavation at the main plant and oxidation ponds could expose workers and the environment to metals concentrations above action levels. However, implementation of Mitigation Measures HAZ-2b (Health and Safety Plan), HAZ-2c (Soil and Groundwater Management Plan), described below, would reduce this impact to a less-than-significant level by ensuring appropriate procedures for worker health and safety and the safe and lawful disposal of hazardous materials.

**Mitigation Measures**

**Mitigation Measure HAZ-2a: Hazardous Building Materials Abatement**

The City (or for WPF, District) shall ensure that, prior to demolition, the building is surveyed for hazardous building materials including, electrical equipment containing polychlorinated biphenyl (PCBs), fluorescent light ballasts containing PCBs or bis(2-ethylhexyl) phthalate (DEHP), and fluorescent light tubes containing mercury vapors. These materials shall be removed and properly disposed of prior to the start of demolition or renovation. Light ballasts that are proposed to be removed during renovation shall be evaluated for the presence of PCBs and in the case where the presence of PCBs in the light ballast cannot be verified, they shall be assumed to contain PCBs, and handled and disposed of as such, according to applicable laws and regulations. Any other hazardous building materials identified either before or during demolition or renovation shall be abated according to federal, state, and local laws and regulations.

**Mitigation Measure HAZ-2b: Health and Safety Plan**

For any elements involving ground disturbing activities, the City (or for WPF, District) or its contractor will prepare a Health and Safety Plan in accordance with federal OSHA regulations (29 CFR 1910.120) and Cal/OSHA regulations (8 CCR Title 8, Section 5192). The Plan will be based on all the proposed Master Plan improvements involving ground disturbance and include designated personnel responsible for implementation of the Health and Safety Plan. The City will require each contractor for each individual construction contract to implement the Plan. The Plan will include all required measures to protect construction workers and the general public potentially exposed to hazardous materials or wastes by including engineering controls, monitoring, and security measures to prevent dangerous levels of exposure and unauthorized entry to the construction area, and to reduce hazards outside of any construction area. If prescribed contaminant exposure levels are exceeded, personal protective equipment shall be required for workers in accordance with state and federal regulations. Compliance with the City’s Health and Safety Plan will not be construed as approval of the adequacy of the contractor’s health and safety professional’s qualifications or any safety measure taken in or near the construction site. The contractor will be solely and fully responsible for compliance with all laws, rules, and regulations applicable to health and safety during the performance of the construction work.
Mitigation Measure HAZ-2c: Soil and Groundwater Management Plan

For any elements involving ground disturbing activities, the City (or for WPF, District) will require the construction contractor to implement a Soil and Groundwater Management Plan, subject to review by the City that specifies the method for handling and disposal of contaminated soil and groundwater prior to demolition, excavation, and construction activities. The plan will include all necessary procedures to ensure that any excavated materials and fluids from throughout the Master Plan area generated during construction are stored, managed, and disposed of in a manner that is protective of human health and in accordance with applicable laws and regulations. The plan will include the following information.

- Step-by-step procedures for evaluation, handling, stockpiling, storage, testing, and disposal of excavated material, including criteria for reuse and offsite disposal. All excavated materials shall be inspected prior to initial stockpiling, and spoils that are visibly stained and/or have a noticeable odor shall be stockpiled separately to minimize the amount of material that may require special handling.

- Procedures to be implemented if unknown subsurface conditions or contamination are encountered, such as previously unreported tanks, wells, or contaminated soils.

- Detailed control measures for use and storage of hazardous materials to prevent the release of pollutants to the environment, and emergency procedures for the containment and cleanup of accidental releases of hazardous materials to minimize the impacts of any such release. These procedures shall also include reporting requirements in the event of a reportable spill or other emergency incident. At a minimum, the City or its contractor shall notify applicable agencies in accordance with guidance from the California Office of Emergency Services as well as the Santa Clara County Environmental Health Department.

- Procedures for containment, handling and disposal of groundwater generated from construction dewatering, the method used to analyze groundwater for hazardous materials likely to be encountered at specific locations and the appropriate treatment and/or disposal methods.

Conclusion: Less than Significant with Mitigation.

Impact HAZ-3: Portions of the project could be located on sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment, a less-than-significant impact with mitigation.

Construction

As described above in Section 4.11.1.4, the WPCP is not listed pursuant to Government Code Section 65962.5 (Cortese list). Two other hazardous materials sites listed pursuant to Government Code Section 65962.5 were identified in the Master Plan area: the Sunnyvale Landfill and the BOP/Recycling Center. The proposed Administration Building would be located on these listed
sites. Construction activities at this location would encounter hazardous materials in soil and/or groundwater. As discussed under Impact HAZ-2, the potential adverse effects on the public and the environment from a release of hazardous materials in soil or groundwater would be reduced to a less-than-significant level through mandatory compliance with regulations and implementation of Mitigation Measures HAZ-2b (Health and Safety Plan) and HAZ-2c (Soil and Groundwater Management Plan).

**Operation**

Once the Administration Building is operational, workers would inhabit the building during normal work hours. Without adequate precaution, workers in enclosed areas could be exposed to elevated levels of gas emitted by the landfill. Any of the gases that comprise landfill gas can, either individually or in combination, create an asphyxiation hazard if they are present at levels sufficient to create an oxygen-deficient environment (ATSDR, 2001). Pursuant to California regulations, the City of Sunnyvale (as former operator of the landfill) is required to comply with the California Title 27 Post-closure Land Use Regulations, which require that construction within 1,000 feet of the boundary of any disposal area be designed and constructed in a way that prevents landfill gas migration into buildings. The Title 27 regulations include specific design and materials requirements to limit gas migration, and require periodic gas monitoring inside all buildings and underground utilities. The City would be required to submit the proposed site use to the local enforcement agency (in this case the SCCDEH) for review. The SCCDEH would review project design to ensure compliance with Title 27 regulations. During operations, methane levels would be monitored at least quarterly (unless otherwise determined by the SCCDEH), and the results of methane gas monitoring would be reported to the SCCDEH. With mandatory compliance with Title 27 requirements, the risk posed to public health and the environment from operation of the Administration Building on a known hazardous materials site would be less than significant.

**Mitigation Measures**

Implement Mitigation Measures HAZ-2b (Health and Safety Plan) and HAZ-2c (Soil and Groundwater Management Plan).

**Conclusion:** Less than Significant with Mitigation.

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**Impact HAZ-4:** The Master Plan structures would be within two miles of Moffett Federal Airfield, but would pose no safety hazard for workers at the WPCP, a less than significant impact.

The WPCP is located approximately 1.75 miles east of the Moffett Federal Airfield, which is operated by the NASA Ames Research Center. However, the WPCP is located outside the airport’s noise contour and approach zone. The proposed structures would be well below the airport’s height restriction area. The maximum allowable structure height in the project vicinity is 182 feet (Santa Clara County Airport Land Use Commission, 2012). Based on these factors, the project’s proximity to the airfield would not result in a safety hazard for people working at the WPCP site.
Mitigation: None required.

Impact HAZ-5: The project would not impair or interfere with an adopted emergency response plan or emergency evacuation plan but could interfere with emergency response provider access in the WPCP vicinity, a less-than-significant impact with mitigation.

While Santa Clara County has adopted an emergency response plan, the plan does not identify specific emergency response or evacuation routes. Regardless, the project would be considered to have a significant impact on emergency response or evacuation if project construction or operation would block access routes to emergency response providers or emergency evacuation routes in the WPCP vicinity.

Project construction for the main plant, oxidation ponds, and Administration Building would be within these facilities and would not affect nearby roadways. Construction of the new trail access on Caribbean Drive could require the closure of one or more lanes of traffic, which would restrict the flow of traffic and could potentially interfere with emergency response operations. However, Mitigation Measure TR-1b (Implement a Temporary Traffic Control Plan) would include restrictions on working days and hours, identification of detour routes, if needed, and provisions for emergency access during construction. Implementation of Mitigation Measure TR-1b would reduce the impacts to less than significant.

Project operation would be limited to within the WPCP site. The WPCP would maintain its emergency response/operations plan to ensure that there is adequate access to the plant for emergency response providers and egress for plant personnel in the event of an emergency requiring evacuation.

Mitigation Measures

Implement Mitigation Measure TR-1b (Implement a Temporary Traffic Control Plan).

Conclusion: Less than Significant with Mitigation.

4.11.3.5 WPF Impacts and Mitigation Measures

Impact WPF-HAZ-1: Project operation would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, a less-than-significant impact.

The proposed MBR facilities at the WPCP would include the routine transport and use of sodium hypochlorite, aqueous ammonia, sulfuric acid, and a scale inhibitor. The chemical storage and handling systems for these wastewater treatment chemicals would be designed and constructed in accordance with the specific requirements for the safe storage and handling of hazardous
materials set forth in the California Fire Code. All hazardous materials would be transported to the plant in compliance with federal and state regulations. Any wastes from routine cleaning of membranes would be processed by the WPCP solids handling facilities, in accordance with those regulations. The WPCP has a HMBP that outlines hazardous materials storage and handling, emergency response and notification procedures, and employee health and safety training requirements. The City would update its existing HMBP to incorporate additional hazardous materials to be utilized under the Master Plan. The updated HMBP would be submitted to the local CUPA, the Sunnyvale Department of Public Safety, Hazardous Materials Compliance Unit. Together, these regulations would reduce the potential for significant hazards to the public or the environment from the routine transport, use or disposal of hazardous materials.

The operation of the water conveyance pipelines and injection wells would not involve the routine use of hazardous materials; therefore, these operations would have no impact related to this criterion.

**Mitigation:** None required.

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Impact WPF-HAZ-2: Project construction could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials, a less-than-significant impact with mitigation.

The discussion below addresses the impacts of reasonably foreseeable upset and accident conditions involving the release of hazardous materials associated with the WPF infrastructure components.

**WPF at the WPCP**

The impacts of the WPF at the WPCP would be the same as those described above in Impact HAZ-2. Implementation of Mitigation Measures HAZ-2a (Hazardous Building Materials Abatement), HAZ-2b (Health and Safety Plan), and HAZ-2c (Soil and Groundwater Management Plan) would reduce the impacts of implementation of the WPF at the WPCP to less-than-significant levels.

**Groundwater Replenishment Facilities Pipelines, Injection Wells, and Recharge Basins**

As discussed above in Section 4.11.1.4, Hazardous Materials in Soil and Groundwater, there are multiple active hazardous materials sites located near some of the recharge basins and within the area proposed for injection wells. Hazardous materials sites may also be located in proximity to the conveyance pipelines; however, specific pipeline routes have not yet been determined. The locations of hazardous materials sites relative to the proposed area for the injection wells are shown on Figure 4.11-1 and to existing recharge basins shown on Figure 4.11-2. Typical contaminants associated with types of hazardous materials sites (e.g. fuel leak cases, dry cleaners) in the proposed injection well area include petroleum hydrocarbons and its constituents, volatile organic compounds, and metals. In addition, the use of hazardous materials (such as fuels, lubricants, solvents, etc.) during construction has the potential to result in reasonably foreseeable
spills and accident conditions that could release hazardous materials, creating a hazard for the public or the environment.

If present, and in the absence of proper handling procedures, soil excavation for conveyance pipelines and injection well drilling could expose workers and the environment to soil and groundwater contamination, which could be a significant impact. However, implementation of Mitigation Measures WPF-HAZ-2a (Health and Safety Plan) and WPF-HAZ-2b (Soil and Groundwater Management Plan) would reduce this impact to a less-than-significant level by ensuring that, in the event soil and groundwater is encountered, appropriate plans and procedures are in place so that the exposures to these hazardous materials do not result in significant hazards for construction workers, the public and the environment.

Potential leaks and spills of hazardous materials used during construction could result in exposures to workers and the public, or become entrained in stormwater runoff and adversely affect the downstream environment. Construction that would result in the disturbance of one acre or more would be required to obtain coverage for construction stormwater discharges under the Construction General Permit, which requires preparation of a SWPPP outlining construction BMPs related to housekeeping (storage of construction materials, waste management, vehicle storage and maintenance, pollutant control); non-stormwater management; erosion and sediment control; and run-on, run-off control. Implementation of the SWPPP would reduce the potential impact related to the discharge of potential water quality pollutants associated with construction activities to a less-than-significant level.

Construction less than one acre would be required to comply with the conditions of the Santa Clara County Grading Permit which includes stormwater and subsurface water disposal requirements, erosion prevention and sediment control measures. Adherence to these conditions would ensure that sediment or other pollutant emissions from the WPF groundwater replenishment facilities during construction would be minimized.

With compliance with construction water quality regulations, potential adverse effects related to reasonably foreseeable upset and accident conditions involving the release of hazardous construction chemicals into the environment would be less than significant.

**Mitigation Measures**

Implement Mitigation Measures HAZ-2a (Hazardous Building Materials Abatement), HAZ-2b (Health and Safety Plan) and HAZ-2c (Soil and Groundwater Management Plan).

**Mitigation Measure WPF-HAZ-2a: Health and Safety Plan**

For any elements involving ground disturbing activities, the District or its contractor will prepare a Health and Safety Plan in accordance with federal OSHA regulations (29 CFR 1910.120) and Cal/OSHA regulations (8 CCR Title 8, Section 5192). The Plan will be based on all the proposed WPF improvements involving ground disturbance and include designated personnel responsible for implementation of the Health and Safety Plan. The District will require each contractor for each individual construction contract to implement
the Plan. The Plan will include all required measures to protect construction workers and the general public potentially exposed to hazardous materials or wastes by including engineering controls, monitoring, and security measures to prevent dangerous levels of exposure and unauthorized entry to the construction area, and to reduce hazards outside of any construction area. If prescribed contaminant exposure levels are exceeded, personal protective equipment shall be required for workers in accordance with state and federal regulations. Compliance with the District’s Health and Safety Plan will not be construed as approval of the adequacy of the contractor’s health and safety professional’s qualifications or any safety measure taken in or near the construction site. The contractor will be solely and fully responsible for compliance with all laws, rules, and regulations applicable to health and safety during the performance of the construction work.

Mitigation Measure WPF-HAZ-2b: Soil and Groundwater Management Plan

For any elements involving ground disturbing activities, the District will require the construction contractor to implement a Soil and Groundwater Management Plan, subject to review by the District that specifies the method for handling and disposal of contaminated soil and groundwater prior to demolition, excavation, and construction activities. The plan will include all necessary procedures to ensure that any excavated materials and fluids from throughout the WPF areas generated during construction are stored, managed, and disposed of in a manner that is protective of human health and in accordance with applicable laws and regulations. The plan will include the following information.

- Step-by-step procedures for evaluation, handling, stockpiling, storage, testing, and disposal of excavated material, including criteria for reuse and offsite disposal. All excavated materials shall be inspected prior to initial stockpiling, and spoils that are visibly stained and/or have a noticeable odor shall be stockpiled separately to minimize the amount of material that may require special handling.

- Procedures to be implemented if unknown subsurface conditions or contamination are encountered, such as previously unreported tanks, wells, or contaminated soils.

- Detailed control measures for use and storage of hazardous materials to prevent the release of pollutants to the environment, and emergency procedures for the containment and cleanup of accidental releases of hazardous materials to minimize the impacts of any such release. These procedures shall also include reporting requirements in the event of a reportable spill or other emergency incident. At a minimum, the District or its contractor shall notify applicable agencies in accordance with guidance from the California Office of Emergency Services as well as the Santa Clara County Environmental Health Department.

- Procedures for containment, handling and disposal of groundwater generated from construction dewatering, the method used to analyze groundwater for hazardous materials likely to be encountered at specific locations and the appropriate treatment and/or disposal methods.

Conclusion: Less than Significant with Mitigation.
4. Environmental Setting, Impacts, and Mitigation Measures
4.11 Hazards and Hazardous Materials

Impact WPF-HAZ-3: The project could be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment, a less-than-significant impact with mitigation.

Construction
Impact WPF-HAZ-2 discusses the potential impact of project construction located on a hazardous materials site, such as those compiled pursuant to Government Code Section 65962.5. Those impacts relate to the potential exposure to or release of contaminated soil or groundwater. As described, Mitigation Measures WPF-HAZ-2a (Health and Safety Plan) and WPF-HAZ-2b (Soil and Groundwater Management Plan) would reduce the potential for adverse effects on workers, the public, or the environment by ensuring that provisions for worker health and safety, and management of excavated and drilled soil and groundwater would be implemented in a safe and lawful manner.

Operations
This impact discussion addresses the potential impacts on project operations resulting from the location of recharge facilities, injection wells and conveyance pipelines on or near a hazardous waste site. Significant impacts could result if potential contamination from hazardous waste sites adversely affects the quality of WPF water released in recharge basins, target groundwater aquifers or water conveyance pipelines.

The locations of hazardous materials sites relative to the existing recharge basins are shown on Figure 4.11-2. A number of closed cleanup sites are located near the two recharge basins located east of Highway 17; several are near the recharge basins by South Winchester Boulevard. In addition, the nearby Pacific Aerospace Services is listed as DTSC cleanup site on GeoTracker; however, site-specific information indicates that this facility is closed and no further cleanup action is needed. Completed investigations and case closure by the responsible regulatory agencies indicate that residual contamination at these listed hazardous material sites, if any, is not considered a threat to groundwater quality. Therefore, operation of the recharge basins as proposed for the WPF would not result in a significant hazard to the public or the environment related to exposure to hazardous materials at those sites.

The locations of hazardous materials sites relative to the area within which injection wells would be constructed are shown on Figure 4.11-1. The active Orchard Farm Shopping Center is located along the northern border of the proposed injection area and has soil contaminated with perchloroethene from a dry cleaner facility. Three active fuel leak sites are located midway along the eastern side of the proposed injection area with soil and shallow groundwater contaminated with fuels and fuel oxygenates (e.g., MTBE). The direction of shallow groundwater flow in the proposed injection area is to the north toward San Francisco Bay. Consequently, groundwater contamination resulting from the four active hazardous materials sites would generally flow away from the proposed injection area. However, it is possible that new hazardous materials sites could be identified within the injection area and/or that pumping throughout the valley results in localized redirection of the general flow path.
As discussed in Section 4.9.1.7, Groundwater, groundwater is located within coarse grained layers of fluvial sand and gravel ranging in thickness from 10 to 200 feet, separated by finer grained silt and clay layers that act as aquitards, i.e. impermeable layers. There are several aquifers, and therefore several impermeable layers, separating the shallow groundwater that is typically affected by the relatively surficial contamination of petroleum hydrocarbon releases, and the deeper groundwater basin used for drinking water. The proposed injection wells would inject purified water into groundwater aquifers located a depth of between 500 and 800 feet below ground surface. The distance between shallow groundwater contamination caused by listed hazardous materials sites and the target WPF groundwater aquifers, as well as the presence of several intervening aquitards, suggest that the potential for contamination of the deep groundwater is relatively low; however, potential contamination cannot be entirely discounted. Water wells present a potential conduit between the groundwater layers which, if not properly installed, could allow groundwater flow between contaminated shallow aquifers and the deep, drinking water aquifers, which would be a significant impact. Further, as discussed above, new hazardous waste sites may be identified prior to project implementation. Implementation of Mitigation Measure WPF-HAZ-3a (Injection Well Siting and Design) would reduce the potential impact of locating injection well facilities on a hazardous material site by requiring siting studies of proposed well locations to evaluate the potential for contamination of the WPF aquifer from identified hazardous materials sites and appropriate design of injection wells to prevent cross-contamination.

The location and type of conveyance pipelines for groundwater replenishment facilities has not yet been determined; it may include existing pipelines or require the installation of new pipes. As such, proposed pipelines may be located on or near known hazardous material sites. Depending upon the type of contamination and the pipeline design (i.e. protective coatings and joint sealants), chemicals present in soil and/or groundwater have the potential to deteriorate pipe materials and adversely affect the quality of water in the target injection well aquifer. Implementation of Mitigation Measure WPF-HAZ-3b (Purified Water Pipelines Siting and Design) would protect the target injection well aquifer from contamination. With implementation of the mitigation measures below, the potential impact of locating WPF injection wells or pipelines on sites listed pursuant to Government Code Section 65962.5 would be less than significant.

**Mitigation Measures**

Implement Mitigation Measures WPF-HAZ-2a (Health and Safety Plan) and WPF-HAZ-2b (Soil and Groundwater Management Plan).

**Mitigation Measure WPF-HAZ-3a: Injection Well Siting and Design**

The District will require a Phase I Environmental Site Assessment of proposed injection wells sites to identify hazardous materials uses and facilities with known soil and/or groundwater contamination with the potential to affect groundwater at proposed injection well locations. If facilities with the potential to contaminate groundwater are identified within ¼-mile of proposed well locations, the District shall retain a licensed hydrogeologist to evaluate the potential for contamination to affect WPF aquifers and to identify appropriate measures to ensure that groundwater in the target injection well aquifer is not
affected by shallow groundwater contamination. Such measures could include, but are not limited to, relocation of the proposed injection facility, installation of well casing to seal off the upper aquifer from lower units, or similar measures. All protective measures shall be incorporated into the design of or contract specifications for the injection wells.

**Mitigation Measure WPF-HAZ-3b: Purified Water Pipeline Siting and Design**

Prior to any pipeline construction activities, the District or its contractor will conduct an initial site investigation of proposed purified water pipeline sites to confirm the absence of contaminated soil or groundwater that may exist within the area to be excavated. Additional investigations may be required based on the results of the initial investigation. Regardless of the results of the investigation, any hazardous materials that are found during construction of the pipeline would be handled in compliance with applicable laws and regulations regarding transport, handling, disposal, and storage. All federal, state, and local reporting requirements would be followed regarding the use and handling of hazardous and non-hazardous materials at the project site.

**Conclusion:** Less than Significant with Mitigation.

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**Impact WPF-HAZ-4:** The WPF facilities at the WPCP would be within two miles of Moffett Federal Airfield, but would not affect the safety hazard for WPCP workers, a less-than-significant impact.

The WPCP is located approximately 1.75 miles east of the Moffett Federal Airfield, which is operated by the NASA Ames Research Center. However, the WPCP is located outside the airport’s noise contour and approach zone. The proposed structures would be well below the airport’s height restriction area. The maximum allowable structure height in the project vicinity is 182 feet (Santa Clara County Airport Land Use Commission, 2012). Based on these factors, the project’s proximity to the airfield would not result in a safety hazard for people working at the WPCP site.

**Mitigation:** None required.

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**Impact WPF-HAZ-5:** The project would not impair or interfere with an adopted emergency response plan or emergency evacuation plan but could interfere with emergency response provider access, a less-than-significant impact with mitigation.

While Santa Clara County has adopted an emergency response plan, the plan does not identify specific emergency response or evacuation routes. Regardless, the project would be considered to have a significant impact on emergency response or evacuation if project construction or operation would block access routes to emergency response providers or emergency evacuation routes in the project vicinity.
Construction of the WPF at the WPCP would include construction of the new trail access on Caribbean Drive, which could require the closure of one or more lanes of traffic. Lane closure would restrict the flow of traffic and could potentially interfere with emergency response operations. The conveyance pipelines would either use existing pipelines or new pipelines that would likely be constructed within public streets. As previously noted, the precise alignments are to be determined. Construction of new pipelines would require lane closures, which would restrict the flow of traffic and could potentially interfere with emergency response operations. In addition, construction of the injection wells could require lane closure on narrower streets. However, Mitigation Measure WPF-TR-1 (Implement a Temporary Traffic Control Plan) would include restrictions on working days and hours, identification of detour routes, if needed, and provisions for emergency access during WPF construction. Implementation of Mitigation Measure WPF-TR-1 would reduce the impacts to less than significant.

WPF operations at the WPCP would be contained within the WPCP site. Operation of the groundwater replenishment facilities would entail inspection and maintenance of injection well facilities. These activities would not occur within local roadways and would add only negligible vehicle trips to local roadways. Similar to pipeline construction, any future pipeline rehabilitation or repairs would require traffic control measures that provide adequate emergency access or detours. The WPF improvements would not result in significant safety hazards related to interference with an adopted emergency response plan or emergency evacuation plan.

**Mitigation Measures**

Implement Mitigation Measure WPF-TR-1 (Implement a Temporary Traffic Control Plan).

**Conclusion:** Less than Significant with Mitigation.

**Impact WPF-HAZ-6:** The project would not result in significant health hazards from hazardous emissions or the handling hazardous materials within 0.25 mile of an existing or proposed school, a less-than-significant impact.

As discussed in Section 4.11.1.7, Schools, there are 16 schools within one-quarter mile of the well injection area and recharge basins. Depending on the final location of the conveyance pipelines, there may be additional schools within one-quarter mile of WPF components. Location within one-quarter mile of a school could be a significant impact if the use of hazardous materials during project construction or operation would cause hazardous emissions that would result in harmful exposures to students, considered sensitive receptors, at nearby schools.

Although construction activities could result in the inadvertent release of small quantities of hazardous materials, a spill or release at a construction site would not result in an emission with the potential to result in exposures to individuals at nearby schools. Standard construction BMPs, and those required by construction stormwater permits, include measures for the safe handling
and storage of hazardous materials used during construction to prevent a release and methods to contain any such release if it should occur. Because the potential for a release resulting from the use or handling of hazardous materials at a construction site to affect individuals at nearby schools would be low, the potential impact related to the use of hazardous materials at these sites would be less than significant.

Operation of water conveyance pipelines and injection wells would not involve the handling of hazardous materials; therefore, there would be no potential impacts from emissions and hazardous materials use within 0.25 mile of a school.

With compliance with existing regulations and construction BMPs, the potential impact resulting from the handling of hazardous materials within 0.25 mile of a school would be less than significant.

**Mitigation:** None required.

### 4.11.4 References


California Environmental Protection Agency (Cal EPA), 2005, Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties, January 2005.


City of Sunnyvale, 2015, Summary of Plant Chemical Usage, WPCP Master Plan.


Department of Public Safety (City of Sunnyvale), 2010. Fire Prevention and Environmental Programs Consolidated Permit for Water Pollution Control Plant. Issued June 14, 2010.


4. Environmental Setting, Impacts, and Mitigation Measures

4.11 Hazards and Hazardous Materials


SWRCB, 2014a. Site identified with waste constituents above hazardous waste levels outside the waste management unit. Available at http://www.calepa.ca.gov/sitecleanup/corteselist/

SWRCB, 2014 b. “Active” CDO and CAO from Water Board. Available at http://www.calepa.ca.gov/sitecleanup/corteselist/


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4.12 Public Services and Facilities

This section addresses potential impacts associated with public services – including fire protection, emergency medical services, police protection, public schools, and parks – due to implementation of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan (Master Plan) and Water Purification Facilities (WPF). The section evaluates whether the Master Plan or WPF would require new or physically altered governmental facilities to maintain adequate service ratios, response times, or other performance objectives, the construction of which would result in substantial adverse physical impacts on the environment. Section 4.13, Utilities and Service Systems, addresses effects on water supply, sewer, and solid waste disposal. Section 4.2, Land Use and Recreation, addresses impacts on recreational facilities.

4.12.1 Setting

This section describes the existing public services within the Master Plan area and for the Water Purification Facilities. The Water Purification Facilities would be located at the WPCP and at locations south of the WPCP (i.e., groundwater replenishment facilities area). Existing recharge basins that could be used for groundwater replenishment are with the City of Campbell, near the intersection of State Routes 17 and 85. Injection wells could be sited in an area roughly bordered by State Route 85, San Tomas Aquino Creek, and Calabazas Creek (refer to Figure 3-12). Pipeline alignments would be located between the WPCP, the injection well siting area, and the recharge basins.

4.12.1.1 Fire Protection and Police Services

Police, fire and emergency medical services within the City are fully integrated under the City’s Department of Public Safety. The Department of Public Safety is located at 700 All America Way in Sunnyvale, approximately 3.6 miles south of the WPCP. All of the City’s sworn public safety officers are fully trained in all three disciplines. Within the Department of Public Safety, officers are assigned to either the Bureau of Police Services, the Bureau of Fire Services, or Bureau of Special Operations, however, they may be called upon to provide cross-bureau services on a daily basis. The Department of Public Safety has a total of 86 non-sworn personnel. On average, the Public Safety Department responds to approximately 100,000 calls for service per year (City of Sunnyvale, 2011).

**Fire Protection Services**

**Master Plan**

The Fire Services Bureau provides fire protection service for the City of Sunnyvale. The Fire Services Bureau provides Emergency Medical Services, Fire Suppression, Hazardous Material incident mitigation, Rescue Operations, Confined Space Rescue Operations, Fire Prevention/Investigations, and Statewide Mutual Aid Response. On average, the Fire Services Division responds to approximately 7,300 calls for service annually. Of those calls for service, approximately
4. Environmental Setting, Impacts, and Mitigation Measures
4.12 Public Services and Facilities

70 percent are Emergency Medical (EMS) calls. Per year, the Division responds to approximately 620 hazardous material calls and 140 structure fires (City of Sunnyvale, 2015a). There are six fire stations situated throughout the City based on a combination of call volume and response time. From 2012 to 2013, the fire service response time in emergency events was an average of four minutes and one second (City of Sunnyvale, 2015a). Station No. 6, located at 1282 North Lawrence Station Road, is the closest fire station to the Master Plan area (approximately 1.2 miles southeast of the WPCP) and would potentially be the first responder during emergencies.

Water Purification Facilities
Fire protection services within the groundwater replenishment facilities area is provided by the fire departments within each individual City that the groundwater replenishment facilities could be located (i.e., Cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara).

Cupertino and Saratoga contract with the County’s Central Fire District for some or all of these services. The closest fire station to the recharge basins location is the Sunnyoaks Fire Station, located in Campbell at 485 West Sunnyoaks Avenue, approximately 0.06 miles north of the nearest recharge basin. The closest fire station to the injection wells siting area is the San José Fire Department, located at 1248 S Blaney Avenue.

Police Protection
Master Plan
The Bureau of Police Services provides police services for the City of Sunnyvale. The Bureau includes four patrol services contingent. There are two patrol teams that make the 24/7/365 coverage possible. A Captain manages each of the patrol teams. There are five patrol squads that cover the city 24 hours a day, each supervised by a Lieutenant. The number of officers in each of the squads changes depending on the time of the day the shift covers. The Bureau of Police Services has 84 sworn officers and is split into two teams of 39 Officers each, along with a Traffic Safety Unit budgeted for four Officers. Within the City, there are six police beats. From 2012 to 2013, the average police response time in emergency events was four minutes and 55 seconds (City of Sunnyvale, 2015b).

Water Purification Facilities
Police services within the groundwater replenishment facilities area are provided by the police departments within each individual City that the groundwater replenishment facilities could be located (i.e., Cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara). Cupertino and Saratoga contract with the County’s Sheriff’s department for some or all of these services. The closest police station to the recharge basins location is the Campbell Police Department, located at 70 North First Street in Campbell, approximately 0.6 miles north of the closest recharge basin. The closest police station to the injection wells siting area is the Santa Clara County Sheriff’s Office West Valley Station, located at 1601 South De Anza Boulevard in Cupertino.
4.12.1.2 Schools

**Master Plan**

The City is served by four different public school districts: Sunnyvale School District, Santa Clara Unified School District, Cupertino Union School District and Fremont Union High School District. Among these four school districts, the City contains twelve public elementary schools, four public middle schools and one public high school. The Sunnyvale School District is the only district contained entirely within the City and includes eight of the City’s twelve public elementary schools and two of the City’s four public middle schools. In addition, there are nine private schools within the City (City of Sunnyvale, 2011). The WPCP is located within the Sunnyvale School District.

**Water Purification Facilities**

Throughout the groundwater replenishment facilities area there are numerous schools operated by various districts within each City that the groundwater replenishment facilities could be located (i.e., Cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara). The closest school to the recharge basins location is the Canyon Heights Academy, located at 775 Waldo Road in Campbell, approximately 0.25 miles west of the closest recharge basin. Schools within the injection wells siting area fall under the jurisdiction of the Cities of Saratoga, San José and Campbell.

4.12.1.3 Parks and Recreation

**Master Plan**

The City of Sunnyvale owns and operates approximately 745 acres of open space and parkland (comprising approximately seven percent of the City’s land), including twenty neighborhood parks, two golf courses, and several other open space areas. In addition, the City maintains an additional 118 acres of playfields on school property in partnership with three local school districts. In addition to these parks, the City also operates the 1.5 mile Calabazas Creek Trail, a pedestrian and bicycle trail between U.S. 101 and State Route 237, which provides a connection to the San Francisco Bay Trail. The parks and recreation resources closest to the WPCP are described in Section 4.2 (refer to Figure 4.2-1) and include the San Francisco Bay Trail, trails on the landfill property, Sunnyvale Baylands Park, and the Twin Creek Sports Complex.

**Water Purification Facilities**

Throughout the groundwater replenishment facilities area there are numerous public/recreational uses, including areas of open space, regional and local parks, riparian corridors, and outdoor recreation facilities (i.e., sports fields). Many of the open space/parks are located adjacent to waterways.
4.12.2 Regulatory Setting

4.12.2.1 Federal Regulations

There are no federal public services and facilities regulations or policies relevant to the proposed project.

4.12.2.2 State Regulations

*California Fire Code*

The California Health and Safety Code, §13000, et seq. includes regulations concerning building standards (as also set forth in the California Building Code), fire protection systems, fire protection devices (such as extinguishers and smoke alarms, and high-rise building standards), and standards for building inspection and certification.

4.12.2.3 Regional Plans

*San Francisco Bay Conservation and Development Commission and the San Francisco Bay Plan*

The *San Francisco Bay Plan* (Bay Plan) is described in Section 4.2, Land Use. Figure 4.2-3 presents the expected BCDC jurisdictional boundary within the vicinity of the WPCP and BCDC recreation and public access policies that are relevant to the Master Plan are listed in Section 4.2.2.3.

4.12.2.4 Local Plans

*Master Plan*

*City of Sunnyvale General Plan*

Policies and Goals from the City’s General Plan that relate to public services are listed below.

- **Policy LT-4.14**: Support the provision of a full spectrum of public and quasi public services (e.g., parks, day care, group living, recreation centers, religious institutions) that are appropriately located in residential, commercial, and industrial neighborhoods and ensure that they have beneficial effects on the surrounding area.

- **Goal LT-8**: Adequate and Balanced Recreation Facilities. The City strives to provide and maintain adequate and balanced open space and recreation facilities for the benefit of maintaining a healthy community based on community needs and the ability of the city to finance, construct, maintain, and operate these facilities now and in the future.

- **Goal CC-4**: Accessible and Attractive Public Facilities. Provide public facilities which are accessible, attractive and add to the enjoyment of the physical environment.

- **Policy CC-4.2**: Maintain beautiful and comfortable outdoor public places which provide a shared sense of ownership and belonging for Sunnyvale residents, business owners and visitors.
• **Policy CC-7.2**: Maintain a full service Library adequate to meet community needs.

• **Goal CC-12**: Maximize Access to Recreation Services and Amenities. The City strives to maximize access to all of its services, facilities and amenities.

• **Policy CC-12.1**: Locate services at schools, parks and recreational facilities throughout the City and utilize strategies, such as the mobile recreation.

• **Goal SN-3**: Safe and Secure City. Provide a safe and secure environment for people and property in the community by providing effective Public Safety response and prevention and education services.

• **Policy SN-3.1**: Provide rapid and timely response to all emergencies.

• **Goal SN-5**: Effective Fire Service Response System. Provide a fire service response system that will control the spread of fire in buildings and other properties and maintain minimal casualties and property loss from fire and other related emergencies.

• **Goal SN-6**: Effective Emergency Response Capability. Provide effective response capability for emergency medical events and other non-fire incidents that may directly endanger the lives, property and well-being of the community.

**City of Sunnyvale Fire Code**

The Fire Code for the City of Sunnyvale (Sunnyvale Municipal Code, Chapter 16.52) contains standard requirements regarding fire protection systems, fire protection devices and building design, and requires development projects within the City to undergo review from the Fire Marshall prior to occupancy.

**Water Purification Facilities**

**Santa Clara County General Plan**

The strategies, policies and implementation measures from the Santa Clara General Plan (below) are aimed at ensuring well planned, high quality, cost effective public health and safety facilities countywide.

• **C-HS 40**: The health and safety of all county residents should be ensured by the County and cities through the provision of the health care and public safety facilities necessary to support existing and projected demand.

• **C-HS(i) 37**: Identify and integrate community health care and public safety facilities needs into the land use plans of each city and the County.

• **C-HS(i) 39**: Require the inclusion of adequate public safety infrastructure during the development review process.

• **C-HS(i) 41**: Implement an on-going community health and safety services monitoring process which includes representatives from public and private health care providers, community representatives, and services user groups.
4.12.3 Impacts and Mitigation Measures

4.12.3.1 Thresholds of Significance

For the purposes of this EIR, a public services impact is considered significant if implementation of the proposed project would:

- Result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire protection, police protection, schools, parks, or other services.

4.12.3.2 Approach to Analysis

The environmental impact analysis for public services involved an assessment of existing public services standards and capacity. The methodology included corresponding with the various agencies to request current information about service capabilities, service ratios, response times, performance objectives, number of apparatus, etc., and reviewing web-based information.

This analysis focuses on the potential for the Master Plan and WPF to affect the demand for public services in the future. Because the Master Plan and the WPF would not include new residential uses (i.e., permanent dwelling units), they would not generate substantial increases in demand for public schools, libraries, or public health services; therefore, the Master Plan and the WPF would have no impacts related to the construction of new or altered schools, libraries, or public health facilities and no further discussion of these impacts is provided. This analysis specifically focuses on how the Master Plan and WPF could affect the demand for police and fire protection services in the Master Plan and WPF area.

4.12.3.3 Impact Summary

Table 4.12-1 lists the project’s public services and facilities impacts and significance determinations.

<table>
<thead>
<tr>
<th>Impact</th>
<th>PS-1: Impacts on fire and police protection services.</th>
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<tbody>
<tr>
<td>Master Plan</td>
<td>LS</td>
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<tr>
<td>Water Purification Facilities</td>
<td>LS</td>
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LS = Less than Significant impact, no mitigation required
4.12.3.4 Master Plan Impacts and Mitigation Measures

Impact PS-1: The project would not result in substantial adverse physical impacts associated with the need for new or altered police and fire protection facilities in order to maintain acceptable service ratios, a less-than-significant impact.

Construction

Construction of proposed improvements to treatment operations would involve several general types of activities: demolition or rehabilitation of some existing facilities and site clearing; earthwork (grading, excavation, sheet pile driving, and groundwater dewatering); and facility construction. As indicated in Section 3.4.8, Construction Characteristics, of Chapter 3, Construction would occur throughout the Master Plan Planning Period (to 2035); within the construction period for each improvement there would be periods of more intensive activity and attendant peaks in construction traffic, typically occurring during earthwork, followed by longer periods of reduced activity. The estimated maximum size of the construction workforce traveling to and from each work site on an average day would not be expected to exceed the maximum amount for the Primary Treatment Facility project (i.e., 28-person work crew). Potential incidents requiring law enforcement, fire protection, or emergency services could occur during construction; however, any temporary increase in incidents would not be expected to exceed the capacity of local law enforcement, fire protection, and emergency facilities such that new or expanded facilities would be required. Any temporary increase in the local population during project construction would be negligible and could be accommodated by existing service providers. As shown in Figure 3-4, the implementation schedules for improvements are expected to overlap. Construction activities would occur primarily within the main plant. Staging areas for short-term storage of heavy equipment, piping and other materials, as well as parking for project construction workers would be provided onsite during the construction phases, as space is available and potentially at offsite locations (none have been identified to date). To ensure that construction traffic can be accommodated without disrupting access, including emergency access, a designated construction access point would be located adjacent to the existing access gate. Construction traffic and the changes to Caribbean Drive could disrupt traffic flow on local access roadways, potentially affecting fire, police, and emergency response times in the Master Plan area. Refer to Impacts TR-1 and TR-3 in Section 4.3, Transportation, for discussion of this issue. However, such effects would not result in the need for new or altered police or fire protection facilities, and the impact of Master Plan construction related to adverse physical impacts associated with the need for new or altered police and fire protection facilities would be less than significant.

Operation

The proposed improvements to the WPCP are expected to result in the same work force of 34 operations and maintenance staff (refer to Section 3.4.9, Operating Characteristics, for additional details). Because the size of the work force would not change, there would be no need for provision of new or expansion of existing police or fire facilities to maintain response times. In addition, the Fire Department would review all project designs at the time building permits are
issued to ensure that adequate fire and life safety measures are incorporated into the project in compliance with all applicable state and city fire safety requirements and to ensure that Fire Department personnel would have adequate access to the site. The impact of Master Plan operations is considered less than significant.

Mitigation: None required.

4.12.3.5 WPF Impacts and Mitigation Measures

Impact WPF-PS-1: The project would not result in substantial adverse physical impacts associated with the need for new or altered police and fire protection facilities in order to maintain acceptable service ratios, a less-than-significant impact.

Construction

Construction of proposed improvements at the WPCP for the WPF would involve the same type of construction activities as described above under Impact PS-1. Injection well construction would involve site preparation (e.g., grading, demolition if needed). The actual drilling could require 24-hour construction. The estimated maximum size of the construction workforce traveling to and from each work site on an average day would not be expected to exceed the maximum amount for the Primary Treatment Facility project (i.e., 28-person work crew). Potential incidents requiring law enforcement, fire protection, or emergency services could occur during construction; however, any temporary increase in incidents would not exceed the capacity of local law enforcement, fire protection, and emergency facilities such that new or expanded facilities would be required. Any temporary increase in the local population during project construction would be negligible and could be accommodated by existing service providers.

As discussed for the Master Plan under Impact PS-1, above, construction traffic in the vicinity of the WPCP and the changes to Caribbean Drive could disrupt traffic flow on local access roadways, potentially affecting fire, police, and emergency response times in the WPCP area. In addition, in the groundwater replenishment facilities area, new pipelines, if required, would mostly likely be constructed within existing public streets. The most common technique for constructing pipeline within existing streets is open trenching (also called “cut and cover”). Open trench construction could require at least one travel lane, depending on roadway width and size of the pipeline and trench. Trenchless pipeline installation such as bore and jack could also be used to construct new pipelines to avoid disruption of surface features like creeks or major streets. Construction vehicles and temporary lane closures associated with pipeline construction would disrupt traffic flow, potentially affecting fire, police, and emergency response times in the groundwater replenishment facilities area. Refer to Impacts WPF-TR-1 and WPF TR-3 in Section 4.3, Transportation, for discussion of this issue. However, such effects of WPF construction would be temporary and would not result in the need for new or altered police or fire protection facilities, and the impact of WPF construction would be less than significant.
Operation

The operation of the WPF at the WPCP would be the same as described above, with the exception of an additional three to four workers at the WPCP to operate the WPF. While the number of employees would increase, the WPCP is already served by fire and medical services, and the increase in total staff onsite would not require the development of new public safety facilities to meet service goals. The pipelines, once constructed, would be buried underground and would not be expected to require additional staff for maintenance of the pipelines, since there are existing pipes that would be within the vicinity already being maintained. With implementation of the WPF, the basic operating characteristics of the existing groundwater recharge basins would not change. As operations would not change under the WPF for the pipelines or the recharge basins, there would be no need for provision of new or expansion of police or fire facilities to maintain response times to the recharge basins. When finished, the injection well would consist primary of a concrete pad approximately 400 square feet with pipeline connections. These facilities would be expected to be maintained similar to the new proposed pipelines and would not require provision of additional maintenance staff. In addition, the respective Cities fire departments would review all project designs at the time building permits are issued to ensure that adequate fire and life safety measures are incorporated into the project in compliance with all applicable state fire safety requirements and to ensure that personnel would have adequate access to the site. This impact is considered less than significant, and no mitigation would be required.

Mitigation: None required.

4.12.4 References


4.13 Utilities and Service Systems

This section describes existing utilities and service systems in the vicinity of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan (Master Plan) and Water Purification Facilities (WPF) and evaluates the potential impacts on existing utilities and service systems as a result of implementation of the Master Plan or WPF. Impacts analyzed in this section include water supply, sanitary sewer and wastewater service, and solid waste services. The potential for adverse impacts to utilities and services is limited by the nature of the project (e.g., improvements to wastewater treatment facilities). For reasons stated in Section 4.13.3.2, the following impacts are not addressed in this section because no impacts are anticipated: wastewater treatment standards and capacity, sanitary sewer services, and water supply. Refer to Section 4.16 Energy, regarding impacts related to energy resources, Section 4.10 Water Quality regarding exceeding wastewater treatment requirements, and Section 4.9 Hydrology for analysis of stormwater runoff.

4.13.1 Setting

The Master Plan improvements would take place at and near the WPCP. The WPF would be located at the WPCP and at locations south of the WPCP (i.e., the groundwater replenishment facilities area), as shown on Figure 4.2-2. Existing recharge basins that could be used for groundwater replenishment are within the City of Campbell and are part of the Los Gatos Groundwater Recharge System, near the intersection of State Routes 17 and 85. Injection wells would be sited within an area roughly bordered by State Route 85, San Tomas Aquino Creek, and Calabazas Creek. Pipeline alignments between the WPCP, the injection well siting area and the recharge basins have not been determined but could be located in the Cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara, all within Santa Clara County.

4.13.1.1 Solid Waste Management

**Master Plan**

The City of Sunnyvale has granted an exclusive franchise to Specialty Solid Waste and Recycling to provide solid waste and recycling collection services to the residents and businesses in the City. In 2013, the City diverted approximately 65 percent of solid waste from disposal. This exceeds the requirements of Assembly Bill (AB) 939, which mandates that jurisdictions divert 50 percent of their solid waste from landfill disposal by the year 2000. In addition, Sunnyvale has adopted a Zero Waste Strategic Plan that calls for 75 percent diversion by 2020 and 90 percent diversion by 2030 (City of Sunnyvale, 2013a). Part of the City’s existing diversion effort includes collecting source-separated recyclables and yard trimmings from residences. These materials are delivered to at the SMaRT Station® where the items are sorted, processed, and marketed. Mixed solid waste received at the SMaRT Station® is also sorted to recover recyclable materials using a mixed waste processing system. The non-recyclable solid waste residue from the SMaRT Station® is disposed at the Kirby Canyon Landfill, which has a permitted daily capacity of 2,600 tons. In 2013 Sunnyvale’s contract with Waste Management, which operates Kirby Canyon Landfill, was extended to 2031 (City of Sunnyvale 2013b). According to information available
from CalRecycle, Kirby Canyon Landfill is expected to close in 2022 (CalRecycle, 2015). However, this estimate reflects the estimated closure date stated on the landfill’s Solid Waste Facility Permit, which was issued in 1993. Analysis by City of Sunnyvale staff in 2013 shows that in every year but one from 2002 to 2012 the amount of waste delivered from the SMaRT Station® (which serves two other cities besides Sunnyvale) was below the minimum amount the three cities that use the SMaRT Station® had contracted to deliver to the landfill (City of Sunnyvale, 2013b). The reduction in annual deliveries (which totaled 165,979 tons below the minimum contracted delivery amount over the 11 years) would be expected to extend the landfill’s site life beyond the closing date anticipated in 1993, as was confirmed by the recent contract amendment.

**Water Purification Facilities**

Waste within Santa Clara County may be disposed at any of the following facilities; Guadalupe Landfill, Kirby Canyon Landfill, Newby Island Landfill, Pacheco Pass Landfill, Palo Alto Landfill, Zanker Material Processing Facility, and Zanker Road Landfill. According to Santa Clara County’s third five-year countywide integrated waste management plan review report (which is based on 2006 data), the County has adequate disposal capacity (i.e., greater than 15 years) (Santa Clara County, 2011). Table 4.13-1 below lists landfills in Santa Clara County and the estimated closure year, remaining capacity, and maximum daily waste processing capacity of each.

<table>
<thead>
<tr>
<th>Landfill Location</th>
<th>Location</th>
<th>Estimated Closure Month/Year</th>
<th>Remaining Capacity (cubic yards)</th>
<th>Max Waste Accepted/Day (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newby Island Landfill</td>
<td>1601 Dixon Landing Road, Milpitas, CA</td>
<td>01/2041</td>
<td>21,200,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Zanker Road Landfill</td>
<td>705 Los Esteros Road, San José, CA</td>
<td>08/2015</td>
<td>700,000</td>
<td>1,300</td>
</tr>
<tr>
<td>Guadalupe Landfill</td>
<td>15999 Guadalupe Mines Road, San José, CA</td>
<td>01/2048</td>
<td>11,055,000</td>
<td>1,300</td>
</tr>
<tr>
<td>Kirby Canyon Landfill</td>
<td>910 Coyote Creek Golf Drive, Morgan Hill, CA</td>
<td>12/2022 b</td>
<td>57,271,507</td>
<td>2,600</td>
</tr>
</tbody>
</table>

**NOTE:**

a Alternative daily cover does not count towards the maximum waste accepted per day.

b This estimated closure date, provided at CalRecycle’s Solid Waste Information System (SWIS) website, is apparently based on the landfill’s 1993 Solid Waste Facility Permit (available at the CalRecycle SWIS website) which shows 2022 as the estimated closure year. In 2013 Sunnyvale extended its contract for disposal at Kirby Canyon Landfill to 2031, indicating the landfill’s current expected site life is at least that long. See Section 4.13.1.1 for more information.

4.13.2 Regulatory Setting

4.13.2.1 Federal

*Title 40, Part 503 of the Code of Federal Regulations (Biosolids)*

Title 40 Part 503 of the Code of Federal Regulations (40 CFR Part 503) regulates the use or disposal of treated sewage sludge (or biosolids). This rule establishes the requirements for final use or disposal of biosolids when biosolids are applied to land to condition the soil or fertilize vegetation, placed on a surface disposal site for final disposal, or fired in a biosolids incinerator (U.S. EPA, 2002). The rule contains numerical limits for metals in biosolids, pathogen reduction standards, site restrictions, crop harvesting restrictions and monitoring, and record-keeping and reporting requirements for land-applied biosolids as well as similar requirements for biosolids that are surface-disposed or incinerated (U.S. EPA, 2015).

Generally, the requirements of the Part 503 rule are self-implementing and must be followed even without the issuance of a permit. The rule applies to any entity that applies biosolids to the land or incinerates biosolids, any owner of a biosolids disposal site, or any entity that prepares biosolids for use, incineration, or disposal. Additional reporting requirements apply to publicly owned treatment works with a design flow rate equal to or greater than one mgd, such as the WPCP.

4.13.2.2 State

*California Integrated Waste Management Act of 1989 (AB 939), SB 1016, and AB 341*

The California Integrated Waste Management Act of 1989, or AB 939, established the California Integrated Waste Management Board (whose responsibilities have since been taken over by CalRecycle), requires the implementation of integrated waste management plans and also mandated that local jurisdictions divert at least 50 percent of all solid waste generated (from 1990 levels), beginning January 1, 2000, and divert at least 75 percent by 2010. State law also requires that as part of their integrated waste management plans that counties ensure there is a minimum of 15 years of disposal capacity to serve the county and its cities (Public Resources Code §41701).

SB 1016 updated the local jurisdiction diversion requirements in 2006. The new per capita disposal and goal measurement system moves the emphasis from an estimated diversion measurement number to using an actual disposal measurement number as a factor, along with evaluating program implementation efforts. These two factors will help determine each jurisdiction’s progress toward achieving its Integrated Waste Management Act diversion goals.

Passed in 2011, California’s Mandatory Commercial Recycling Law, AB 341, establishes a policy goal for California that not less than 75 percent of the solid waste generated is source-reduced, recycled or composted by 2020. In addition, AB 341 requires that businesses and public entities that generate four cubic yards or more of waste per week and multifamily entities with five units or more arrange for recycling services. The purpose of this new law is to reduce greenhouse gas
emissions by diverting commercial solid waste from landfills and expand opportunities for recycling in California (CalRecycle, 2015).

4.13.2.3 Local

City of Sunnyvale General Plan

Policies from the City’s 2011 General Plan that relate to utilities are listed below (City of Sunnyvale, 2011).

- **Goal EM-14:** Recycling and Source Reduction Programs. Reduce solid waste through recycling, source reduction, education and special programs.

- **Goal EM-15:** Environmentally-Sound Disposal. Dispose of solid waste in an environmentally sound, dependable and cost-effective manner.

City of Sunnyvale 2008 Zero Waste Policy and Zero Waste Strategic Plan

In 2008, the City adopted a Zero Waste Policy that calls for a reduction in the amount of waste being disposed, as well as efforts to minimize upstream impacts on materials through sustainable manufacturing and consumerism. The Zero Waste Strategic Plan recommends three progressive goals to achieving zero waste: 70 percent diversion by 2015; 75 percent diversion by 2020; and 90 percent by 2030 (City of Sunnyvale, 2013a). The City’s 2020 diversion rate goal of 75 percent parallels California Department of Resources Recycling and Recovery’s (CalRecycle) goal of 75 percent statewide recycling by 2020.

City of Sunnyvale Demolition Permit

The City of Sunnyvale’s Building Division requires applicants to obtain a demolition permit for removal of entire buildings and structures prior to the start of any demolition activities. As part of the demolition permitting process, applicants are required to follow a list of general requirements based on the 2010 California Green Building Code and the Sunnyvale Municipal Code. A portion of the requirements include consideration of deconstructing (i.e., building dismantling) and/or salvage of reusable building materials to minimize the amount of demolition materials disposed of (City of Sunnyvale, 2013c).

4.13.3 Impacts and Mitigation Measures

4.13.3.1 Thresholds of Significance

For the purposes of this EIR, a utilities and service systems impact is considered significant if implementation of the proposed project would result in any of the following:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
4. Environmental Setting, Impacts, and Mitigation Measures

4.13 Utilities and Service Systems

- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Not have sufficient water supply available to serve the project from existing entitlements and resources, or require new or expanded water supply resources or entitlements.
- Result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments.
- Be served by a landfill with insufficient permitted capacity to accommodate the project’s solid waste disposal needs.
- Be out of compliance with federal, state, and local statutes and regulations related to solid waste.

4.13.3.2 Approach to Analysis

This impact discussion assesses potential impacts on existing utilities and service systems during construction and operation of the Master Plan and WPF. In general, implementation of the WPCP improvements would not have long-term effects on the demand for utilities. Short-term disruption to existing utilities such as water, electrical, and natural gas facilities could occur during construction of WPCP improvements.

Due to the nature of the proposed project, the following criteria are not addressed in the impact analysis for the reasons described below.

**Threshold of Significance:** Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

As described in Section 3.3 in Chapter 3, *Project Description*, the objectives of the Master Plan include improving the WPCP treatment operations to maintain wastewater operations to meet regulatory standards, including water quality regulations. For information regarding compliance with water quality standards, refer to Sections 4.9, Hydrology, and 4.10, Water Quality.

**Threshold of Significance:** Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

One of the objectives of the Master Plan is to “maximize the useful life of the existing WPCP facilities in a manner that minimizes rate impacts while maintaining regulatory compliance” (refer to Section 3.3). Construction of wastewater treatment facilities is proposed as part of the Master Plan. The WPF would address the Master Plan challenges and management decisions through different improvements to secondary and tertiary treatment processes while also contributing to District efforts to address the major water supply constraints facing the City and rest of the Santa Clara Valley by providing a sustainable water supply for long-term/future demands. Refer to Sections 4.2 through 4.12 and Sections 4.14 through 4.16 for a description of impacts and mitigation measures associated with construction of the WPCP improvements and WPF; this criterion is not discussed further in this section.
**Threshold of Significance:** Would the project require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

As described in Section 3.4.7, Support Facilities and Related Actions, in Chapter 3, all stormwater originating from surface runoff from the entire WPCP site would be routed to the Influent Junction Box. This stormwater, in combination with raw wastewater influent, would be pumped to the head of the preliminary treatment facilities for treatment. The WPF do not include new stormwater drainage facilities or the expansion of existing facilities. Therefore, this criterion is not discussed further in this section. For a discussion regarding the increased risk of flooding due to runoff, refer to the discussion under Impact HYD-2 in Section 4.9, Hydrology.

**Threshold of Significance:** Would there be insufficient water supply available to serve the project from existing entitlements and resources, or require new or expanded water supply resources or entitlements.

Existing potable water use at the WPCP averages about 0.9 million gallons per month. With implementation of the Master Plan, potable water use is expected to increase by 0.2 million gallons per month. Most existing and proposed plant treatment units that require process water (e.g., for wash down of equipment) rely on effluent produced at the plant; potable water is used for only a few select processes (e.g., pump seals). With implementation of the Master Plan, the additional potable water would be needed for similar processes such as chemical dosing (to mix chemicals to the appropriate concentration) and pump seals. Some potable water is also consumed by employees; however, the Master Plan improvements to the WPCP are expected to result in the same workforce of 34 operations and maintenance staff, thus the water treatment process uses would account for the increase in potable water demand over the Master Planning Period (to 2035).

The WPF at the WPCP would require 3 to 4 additional workers. The City of Sunnyvale has projected an addition of approximately 75,000 jobs over the next 10-20 years (City of Sunnyvale, 2011), of which the 3 to 4 jobs anticipated as part of WPF implementation would represent less than 0.1 percent of anticipated job growth. The City of Sunnyvale has indicated that adequate supply commitments and facilities are available to reliably meet the projected water needs of residents and businesses for the next 20 years (City of Sunnyvale, 2011). The membrane bioreactors (MBRs) would also require clean water for maintenance; however, purified water produced by MBRs is generally used as the source of clean water for MBR maintenance. Presuming no potable water is used for MBR maintenance, sufficient water supply would thus be available to serve the WPF from existing entitlements and resources.

Under either the Master Plan or the WPF, the projected increase in potable water use at the WPCP would be more than offset by the projected increase in recycled (or purified) water produced at the WPCP, which in turn would replace potable water use. Consequently, implementation of the Master Plan is not expected to materially increase potable water usage and this criterion is not discussed further in this section.

**Threshold of Significance:** Would the project result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments?

For reasons stated above, this criterion is not addressed.
4.13.3.3 Impact Summary

Table 4.13-2 lists the project’s utilities and service systems impacts and significance determinations.

<table>
<thead>
<tr>
<th>Impact</th>
<th>UT-1: There would be sufficient permitted capacity to accommodate the project’s solid waste disposal needs.</th>
<th>UT-2: The project would be in compliance with federal, state, and local statutes and regulations related to solid waste.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Plan</td>
<td>LS</td>
<td>LS</td>
</tr>
<tr>
<td>Water Purification Facilities</td>
<td>LS</td>
<td>LS</td>
</tr>
</tbody>
</table>

LS = Less than Significant impact, no mitigation required

4.13.3.4 Master Plan Impacts and Mitigation Measures

Impact UT-1: There would be sufficient permitted capacity to accommodate the project’s solid waste disposal needs, a less-than-significant impact.

Construction

Construction activities associated with WPCP improvements, such as demolition and removal of some existing facilities and earthwork (i.e., grading, excavation), would produce solid waste. Excavated materials (spoils) would be stored temporarily onsite, to be used later as fill, or hauled offsite by truck for reuse or disposal. As long as soils slated for offsite disposal are not contaminated with hazardous materials, soils could be used as landfill cover at multiple landfills and are not considered waste, or could be retained and used onsite for construction of the proposed levee (to be implemented by the U.S. Army Corps of Engineers and District through the South Bay Shoreline Study) or for habitat restoration. Soils used onsite for habitat restoration or levee construction or offsite for landfill cover would not affect the remaining disposal capacity of any landfills. Refer to Impact HAZ-2 in Section 4.11, Hazards and Hazardous Materials, for a description of the manner in which contaminated soil would be handled if encountered during construction.

Although the disposition of demolition waste has not been determined, considering that Kirby Canyon Landfill has a permitted daily capacity of 2,600 tons and estimated closure date of 2031, and the disposal capacity reserved for the City pursuant to the extension of Sunnyvale’s contract with Waste Management, which operates Kirby Canyon Landfill, there should be sufficient capacity to handle demolition waste resulting from the WPCP improvements. In addition, compliance with the City’s Zero Waste Policy and Zero Waste Strategic Plan in effect at the time of construction, and provisions of the Sunnyvale’s demolition permit, would substantially reduce the amount of construction and demolition debris generated by Master Plan improvements that would be disposed of at Kirby Canyon Landfill. Refer to Section 3.4.8, Construction Characteristics, in Chapter 3, Project Description, for discussion regarding demolition associated with WPCP.
improvements. Construction impacts to landfills are considered less than significant, and no mitigation is required.

**Operation**

Currently, the dewatered sludge and biosolids are hauled to one of seven available locations, including three land application programs (located in Solano, Merced, and Sacramento), three landfills (Newby Island, Kirby Canyon, and Potrero Hills), and one composting facility (Central Valley Compost Facility). Biosolids have also been landfilled at the Sunnyvale Biosolids Monofill, which is located on the closed landfill south of the SMaRT Station®. The Monofill was designed to accept biosolids from the WPCP when market conditions or the characteristics of the biosolids make it difficult to take them elsewhere (City of Sunnyvale, 2011), and typically is used for disposal of digester solids from periodic digester cleanings. A maximum of 20 dry tons of Class B biosolids is hauled offsite per day. At buildout, approximately 100 cubic yards of biosolids will be generated daily, the removal of which would require approximately 15 truck trips per week. The cost and availability of biosolids disposal alternatives in the future could require the City to further reduce the volume of solids produced at the WPCP. Based on future biosolids disposal needs, a thermal drying facility operating 24 hours per day, five days per week may be constructed in the future. In the near term, the WPCP could diversify by sending biosolids to regional landfills or land application sites that accept biosolids. In the long term, the WPCP could further diversify with more distant landfills, land application sites, and composting. The specific disposition options developed would depend on a variety of considerations including regulatory limitations, facility availability, industry trends, and cost. Although the disposition of the biosolids has not been determined, considering the remaining capacity amounts at the landfills, there should be sufficient capacity to handle waste resulting from operation of the WPCP. In addition, with a thermal drying facility in place, volume of solids produced could be further reduced. Therefore, this impact would be less than significant.

**Mitigation:** None required.

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Impact UT-2: The project would be in compliance with federal, state, and local statutes and regulations related to solid waste, a less-than-significant impact.
```

**Construction**

Construction of WPCP improvements would comply with all applicable regulatory requirements related to solid waste. Contractor specifications for construction of the WPCP improvements would contain requirements for the handling, storage, cleanup, and disposal of hazardous materials; including petroleum-based products, cement, or other construction pollutants. Refer to Section 4.11, Hazards and Hazardous Materials, for additional information on hazardous materials associated with construction of WPCP improvements and how hazardous materials would be handled if encountered during construction. In addition, construction and demolition associated WPCP improvements would comply with the City’s Zero Waste Policy and Zero Waste Strategic Plan. This impact is considered less than significant, and no mitigation is required.
Operation
Operation of WPCP improvements would comply with all applicable regulatory requirements related to solid waste. Refer to Section 4.11, Hazards and Hazardous Materials, for additional information on hazardous materials associated with operation of the WPCP and permitting requirements. This impact is considered less than significant, and no mitigation is required.

Mitigation: None required.

4.13.3.5 WPF Impacts and Mitigation Measures

Impact WPF-UT-1: There would be sufficient permitted capacity to accommodate the project’s solid waste disposal needs, a less-than-significant impact.

Construction
Although the disposition of construction waste associated with the WPF has not been determined, considering the remaining capacity amounts at the landfills in Santa Clara County (Table 4.13-1), there should be sufficient capacity to handle waste resulting from the WPF. In addition, construction and demolition associated with WPCP improvements would comply with the Cities’ applicable waste reduction plans in effect at the time of construction, which would substantially reduce impacts to Santa Clara County landfills. Refer to Section 3.5.8, Construction Characteristics of the WPF, in Chapter 3, Project Description, for discussion regarding demolition associated with WPF improvements. Construction impacts to landfills are considered less than significant, and no mitigation is required.

Operation
Management of biosolids produced under the WPF is expected to be as described under Impact UT-1 for the Master Plan; as discussed, it is expected that adequate landfill capacity would be available to accommodate biosolids generated at the WPCP. The WPF would operate 365 days per year, 24 hours per day. The operating characteristics of the proposed WPF would be determined during conceptual engineering; however, considering the remaining capacity at the landfills in Santa Clara County, any waste generated during operation of the WPF would not be expected to exceed the capacity of existing landfills. Impacts therefore are considered less than significant, and no mitigation is required.

Mitigation: None required.
Impact WPF-UT-2: The project would be in compliance with federal, state, and local statutes and regulations related to solid waste, a less-than-significant impact.

*Construction*

Construction of WPF would comply with all applicable regulatory requirements related to solid waste. Specifications for construction of the WPF improvements would contain requirements for the handling, storage, cleanup, and disposal of hazardous materials; including petroleum-based products, cement, or other construction pollutants. Refer to Section 4.11, Hazards and Hazardous Materials, for additional information on hazardous materials associated with construction of WPF and how hazardous materials would be handled if encountered during construction. This impact is considered less than significant, and no mitigation is required.

*Operation*

Operation of WPF would comply with all applicable regulatory requirements related to solid waste. Refer to Section 4.11, Hazards and Hazardous Materials, for additional information on hazardous materials associated with operation of the WPF. This impact is considered less than significant, and no mitigation is required.

**Mitigation:** None required.

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**4.13.4 References**


4.14 Cultural Resources

This section documents the methods and findings of the cultural resources background research and survey conducted for the Sunnyvale Water Pollution Control Plant (WPCP) Master Plan (Master Plan) and Water Purification Facilities (WPF) at the WPCP, and examines those findings to determine potential impacts on cultural resources as a result of the Master Plan or WPF. A separate cultural resources survey report addressing the WPCP has been completed to fulfill the requirements of Section 106 of the National Historic Preservation Act of 1966 (NHPA; Koenig, 2014). The WPF are analyzed in this section at a program level.

4.14.1 Definition of Cultural Resources

4.14.1.1 Architectural/Structural Resources

Architectural/structural resources are typically elements of the built environment, including but not limited to buildings, structures, objects, and districts; these resources range from single-family residences, stores, schools, and factories to downtown commercial districts, ranches, military bases, roads, railroads, bridges, tunnels, gardens, and statues. The term “structure” is used to create distinction between infrastructure and facilities, such as roads, railroads, trails, bridges, dams, canals, ditches, and retaining walls, and buildings made for purposes other than human shelter such as barns, sheds, or workshops. A structure that has lost its historical configuration or pattern of organization through deterioration or demolition (e.g., bridge footings, foundations) is usually considered a ruin and categorized as an archaeological site.

4.14.1.2 Archaeological Resources

An archaeological site is defined as “the location of a significant event, a prehistoric or historic-era occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value regardless of the value of any existing structure” (National Park Service [NPS], 1990). Prehistoric archaeological materials might include obsidian and chert flaked stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, adobe, or wooden footings, foundations, and walls; artifact-filled wells or privies, and sheet refuse; or deposits of metal, glass, and/or ceramic refuse. Faunal and floral remnants can be associated with both prehistoric and historic-era sites. Human remains can be associated with archaeological sites or found in an isolated context.

4.14.1.3 Paleontological Resources

Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, snails, and marine coral), and fossils of microscopic plants and animals (microfossils). The age and abundance of fossils depend on the
location, topographic setting, and particular geologic formation in which they are found. Fossil discoveries not only provide a historical record of past plant and animal life but can assist geologists in dating rock formations. In addition, fossil discoveries can expand our understanding of the time periods and geographic ranges of existing and extinct flora or fauna.

4.14.2 Setting

4.14.2.1 Natural Environment

The WPCP and proposed WPF are located at the southern end of the San Francisco Bay. The southern San Francisco Bay Area exhibits a Mediterranean climate, with year-round moderate temperatures, mild weather, and approximately 15 inches of rainfall per year. This type of climate is subject to recurring and sometimes long-lasting droughts.

The Bay Area and the surrounding region contain an abundance of natural resources. The southern San Francisco Bay Area hosts a wide variety of ecological communities, including salt marsh, scrub brush, grassland, and foothill woodlands. Deer, elk, and waterfowl were plentiful in prehistory, as were marine and Bay resources such as seals, otters, abalone, mussels, oysters, clams and numerous fish species. Franciscan chert was an easily obtainable local raw material for stone tools. Obsidian could be obtained from the Anadel and Napa Glass Mountain quarries north of the Bay Area (Moratto, 1984). Settlers to the region that arrived in the historic period were attracted to the climate, natural resources, and waterways as well.

Master Plan

Several modified waterways are present in the vicinity of the WPCP including the Sunnyvale East Channel, the Sunnyvale West Channel, the Moffett Channel, the Cargill Channel, and the Guadalupe Slough. The Sunnyvale East Channel flows directly into Guadalupe Slough at the southeast corner of Santa Clara Valley Water District Pond A4 (SCVWD Pond A4). The Sunnyvale West Channel flows indirectly into Guadalupe Slough via Moffett Channel along the west side of SCVWD Pond A4. An earthen levee currently closes off SCVWD Pond A4 from tidal influence. Ponds 1 and 2 are to the west of Moffett Channel. These ponds were historically baylands (tidal marsh and mudflats), but have been closed off from tidal influence by earthen levees and have been actively used by the WPCP for water treatment over several decades. The Cargill Channel to the south and west of Pond 1 was also historically baylands, but is now non-tidal (H.T. Harvey, 2014).

Water Purification Facilities

The injection wells proposed for the WPF are several miles south of the WPCP, in an area roughly bordered by State Route 85, San Tomas Aquino Creek, and Calabazas Creek. The proposed injection wells will be away from the historic bay margins, nearer to the hilly eastern flank of the Santa Cruz Mountains. Pipeline alignments between the WPCP, the injection well siting area, and the recharge basins have not been confirmed but could be located in the cities of Sunnyvale, San José, Campbell, Cupertino, Saratoga, and/or Santa Clara.
4.14.2.2 Geology

The San Francisco Bay Area has undergone dramatic landscape changes since humans began to inhabit the region more than 13,000 years ago. Sea levels began rising about 15,000 years ago, at which time the coastline was located west of the Farallon Islands, and reached the present level of the bay about 5,000 years ago (Helley et al., 1979). This dramatic change in stream base-level has resulted in increased deposition of sediment along the lower reaches of Bay Area streams and along the San Francisco Bay (Helley et al., 1979:18). Gold Rush-era sedimentation has exacerbated this deposition over alluvial fans and within the Bay itself. Active alluvial fan deposits are generally less than 5,000 years old and overlie older land surfaces (including stabilized/abandoned Pleistocene-age alluvial fans). The bedrock surface beneath the existing margins of the San Francisco Bay was exposed up until approximately 5,000 years ago (Atwater et al., 1977). Rising sea levels gradually inundated the bedrock surface and resulted in the deposition of Bay Mud. Bay Mud deposition continued until the first half of the twentieth century when artificial fill was placed to accommodate land reclamation activities.

In many places, the interface between older land surfaces and active alluvial fans or Bay Mud is marked by a well-developed buried soil profile, or a paleosol. Paleosols preserve the composition and character of the earth’s surface prior to subsequent sediment deposition; thus, paleosols have the potential to preserve archaeological resources if the area was occupied or settled by humans (Meyer and Rosenthal, 2007). As human populations have increased since the arrival of the area’s first inhabitants, younger paleosols (late Holocene) are more likely to yield archaeological resources than older paleosols (early Holocene or Pleistocene).

Master Plan

Fugro Consultants, Inc. (2015) reviewed previous investigations and conducted new borings to determine subsurface conditions at the main plant and oxidation ponds. All new boring locations were either within asphalt concrete (AC) paved areas or aggregate base covered roadways. The geotechnical borings were conducted using a skip sampling technique. Skip sampling exposes the subsurface conditions every five or so feet and is therefore not as detailed as the continuous sampling method. Given the invariable stratigraphy, skip sampling adequately provides for subsurface data.

Based on this study, there is approximately 3 to 9 inches of AC over 3 to 18 inches of baserock of the existing pavement. In the western portion of the main plant, historic borings indicate that fill is about 3 to 9 feet thick; this fill generally consisted of stiff to very stiff sandy clay and medium dense clayey sand mixed with AC and concrete rubble, metal fragments, and large pieces of rock. Underlying the fills are medium stiff to very stiff, slightly compressible, highly plastic, organic silty clays extending to depths of 8 to 13 feet below ground surface (bgs). This clay is underlain

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1 Alluvial fans are fan-shaped deposits of water-transported material (alluvium). They typically form at the base of topographic features where there is a marked break in slope, and contain both active and abandoned stream channels, terraces, natural levees and other fluvial morphologies.

2 A paleosol is a buried soil that forms when sediment is deposited over a surface with a developed soil profile without it being eroded away first.
by stiff to very stiff silty clay that extends to the maximum depth explored (50 feet). Thin layers of medium dense silty and clayey sands, and very stiff clayey silts were occasionally encountered at various depths across the site. In the eastern portion of the main plant, the borings indicate the area is blanketed by fill consisting of stiff clay mixed with varying amount of sand, between approximately 8 to 10 feet thick. Underlying the fill is the native medium stiff to very stiff lean clay extending to the maximum depth explored (101.5 feet). Borings north of the drying basin show medium dense to dense sand with varying amount of silt, clay and gravels of 6 to 15 feet thick at approximately 33 to 58 feet bgs. This sand layer appears to be thicker towards the north. Borings drilled within in the drying basin showed similar subsurface conditions without encountering the fill material or sand.

At the oxidation ponds, borings were drilled on the existing levees surrounding the ponds as well as inside the ponds. Depending on the boring locations, the borings generally encountered fills of about 6.5 to 7 feet thick if drilled on the levee crest, and no fill if drilled within the pond. Much of the fill consists of soft to stiff fat clay. Based on previous laboratory testing and visual classification, this fat clay consists of Young Bay Mud borrow material from adjacent excavations to construct the oxidation pond. Other levee fill materials encountered generally consist of very loose to medium dense sand with varying amounts of gravel, and soft to stiff sandy fat clay. Below the levee fill, very soft to soft fat clay with peat was encountered to depths of approximately 15 to 22 feet below the crest of the levees. This stratum has been characterized as being Young Bay Mud. The thickness of the Bay Mud increased in a northerly direction to a maximum depth of about 25 feet. Below the Bay Mud, medium stiff to very stiff clay was encountered to the maximum depth explored of about 43 feet. Layers of loose to medium dense sand with varying amount of silt were encountered within the clay stratum in thickness up to about 5.5 feet.

Based on the review of previous investigations, the central and western portions of the main plant had been placed with fill at various times. The earliest recorded fill (approximately 10 to 12 feet) was placed in 1954 to 1955 in the vicinity of the central portion of the main plant (around the sludge digesters and primary sedimentation tanks). Materials placed during this period had very little compaction effort applied to them. Subsequently, fill was placed between 1956 and 1960 with a variable degree of compaction effort, although no written records are available to confirm this. Around 1975 to 1977, fill was placed around the western portion of the main plant, under the observations of Peter Kaldveer & Associates. In 1983 through 1984, fill was placed mostly east of the primary sedimentation tanks, again under the observation of Peter Kaldveer & Associates. The fill material consists of onsite material such as silty clay and imported fill including sand, gravelly sand, sand clay, and silty clay. Available information indicates that the existing levees around the oxidation ponds were constructed about 1965 by dredging and piling mud from the adjacent ponds.

In short, the main plant and oxidation ponds are underlain by artificial fill and Bay Mud down to at least 13 feet below the existing surface. Beneath the Bay Mud is a deep layer of alluvium to the maximum depth explored (101.5 feet). Within the alluvium are pockets of loose to medium dense sand with varying amount of silt, clay, and gravels possibly representing a former water channel.
Ground disturbing activities in the Plant would be conducted almost exclusively in artificially deposited and/or re-worked soils that have experienced previous construction and engineering or within the layer of Bay Mud below the artificial fill.

**Water Purification Facilities**

The injection wells proposed for the WPF are in the vicinity of the interface between the Holocene-age alluvial fans of the Santa Clara Valley and the Late Pleistocene-age alluvial deposits adjacent to the eastern hillslopes of the Santa Cruz Mountains. Pipelines would extend through Holocene-age alluvium.

### 4.14.2.3 Prehistory

Categorizing the prehistoric period into cultural stages allows researchers to describe a broad range of archaeological resources with similar cultural patterns and components during a given timeframe, thereby creating a regional chronology. Milliken et al. (2007) provide a framework for the interpretation of the San Francisco Bay Area and have divided human history in the San Francisco Bay Area into four periods: the Paleoindian Period (11,500 to 8000 B.C.), the Early Period (8000 to 500 B.C.), the Middle Period (500 B.C. to A.D. 1050), and the Late Period (A.D. 1050 to 1550). Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

The Paleoindian Period (11,500 to 8000 B.C.) was characterized by big-game hunters occupying broad geographic areas. Evidence of human habitation during Paleoindian Period has not yet been discovered in the San Francisco Bay Area. During the Early Period (Lower Archaic; 8000 to 3500 B.C.), geographic mobility continued from the Paleoindian Period and is characterized by the millingslab and handstone as well as large wide-stemmed and leaf-shaped projectile points. The first cut shell beads and the mortar and pestle are documented in burials during the Early Period (Middle Archaic; 3500 to 500 B.C.), indicating the beginning of a shift to sedentism. During the Middle Period, which includes the Lower Middle Period (Initial Upper Archaic; 500 B.C. to A.D. 430), and Upper Middle Period (Late Upper Archaic; A.D. 430 to 1050), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first rich black middens are recorded from this period. The addition of milling tools, obsidian and chert concave-base projectile points, and the occurrence of sites in a wider range of environments suggest that the economic base was more diverse. By the Upper Middle Period, mobility was being replaced by the development of numerous small villages. Around A.D. 430 a “dramatic cultural disruption” occurred evidenced by the sudden collapse of the Olivella saucer bead trade network. During the Initial Late Period (Lower Emergent; A.D. 1050 to 1550), social complexity developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.
4.14.2.4 Ethnography

Based on a compilation of ethnographic, historic, and archaeological data, Milliken (1995) describes a group known as the Ohlone, who once occupied the general vicinity of the WPCP. While traditional anthropological literature portrayed the Ohlone peoples as having a static culture, today it is better understood that many variations of culture and ideology existed within and between villages. While these “static” descriptions of separations between native cultures of California make it an easier task for ethnographers to describe past behaviors, this masks Native adaptability and self-identity. California’s Native Americans never saw themselves as members of larger “cultural groups,” as described by anthropologists. Instead, they saw themselves as members of specific villages, perhaps related to others by marriage or kinship ties, but viewing the village as the primary identifier of their origins.

Levy (1978) describes the language group spoken by the Ohlone, known as “Costanoan.” This term is originally derived from a Spanish word designating the coastal peoples of Central California. Today Costanoan is used as a linguistic term that references to a larger language family spoken by distinct sociopolitical groups that spoke at least eight languages (as different as Spanish is from French) of the same Penutian language group. The Ohlone once occupied a large territory from San Francisco Bay in the north to the Big Sur and Salinas Rivers in the south. The WPCP is between the Puichon tribal area of San Fransiquito and Stevens Creeks and the Tamien tribal area of the Santa Clara vicinity (Milliken et al., 2009: Appendix B). Archaeological investigations at nearby prehistoric sites indicate that while Native Americans mainly used the marshland for resource procurement, including the collection of fish, shellfish, plants, and sea mammals, habitation and burial sites also occurred along the historic bay margins.

Economically, Ohlone engaged in hunting and gathering. Their territory encompassed both coastal and open valley environments that contained a wide variety of resources, including grass seeds, acorns, bulbs and tubers, bear, deer, elk, antelope, a variety of bird species, and rabbit and other small mammals. The Ohlone acknowledged private ownership of goods and songs, and village ownership of rights to land and/or natural resources; they appear to have aggressively protected their village territories, requiring monetary payment for access rights in the form of clamshell beads, and even shooting trespassers if caught. After European contact, Ohlone society was severely disrupted by missionization, disease, and displacement. Today, the Ohlone have a strong presence in the San Francisco Bay Area, and are highly interested in their historic and prehistoric past.

4.14.2.5 History

Spanish explorers in the late 1760s and 1770s were the first Europeans to traverse the Santa Clara Valley. José Francisco Ortega, a soldier in the exploring party of Gaspar de Portola, and Father Juan Crespi, made the first recorded crossing of the Guadalupe River in the vicinity of present-day Alviso during November 1679 but no clear record remains of his exact route and his impressions of the area (Beck and Haase, 1974:16–17). Juan Bautista de Anza and Pedro Font led the next expedition through the area in early 1776, leaving a substantial record of their travels. The explorers commented on the level land and good pasturage, concluding that the area would be an excellent site for settlement (Bolton, 1930). Anza recorded three native villages in the
vicinity of his campsite, each reportedly composed of approximately 70 persons. Anza noted some “paths and trails” heading to the south and concluded that the same tribe of Indians dwelled throughout the entire valley (Bolton, 1930).

After an initial period of exploration, the Spanish focused on the founding of presidios, missions, and secular towns with the land held by the Crown. Following the favorable reports by Anza and Font, the Spanish moved to occupy the lands in the Santa Clara Valley founding both Pueblo de San José and Mission Santa Clara de Asís in 1777. The Pueblo of San José de Guadalupe was California’s first civilian settlement, and one of three towns founded to administer and coordinate the missions and presidios of Alta California (Hendry and Bowman, 1940:750). By the late 18th century, the Embarcadero de Santa Clara at the mouth of the Guadalupe River into the San Francisco Bay had developed as a trading port and separate community. Mission Santa Clara provided for the religious needs of the Pueblo and, as one of seven missions located within Ohlone territory, would have been the mission with the greatest impact on the aboriginal population living in the Santa Clara Valley.

After the independence of Mexico and the secularization of the missions in the 1830s, the mission’s property was divided into ranchos and distributed to private citizens. The WPCP was part of the Mexican land grant known as Rancho Pastoria de las Borregas, a 9,066-acre land grant deeded to Francisco Estrada in 1842. A few years later in 1849, Martin Murphy Jr. purchased half the rancho. The Ohlone and other Native Californians gradually left the now-secular missions, with many going to work as wage laborers on the ranchos, in mines, and in domestic positions. There was a partial return to aboriginal religious practices and subsistence strategies, but for the most part, the Ohlone culture was greatly diminished (Levy, 1978). Today, descendants of the Ohlone still live in the area and many are active in restoring their traditions and advocating for Native American issues.

After California became part of the United States in 1848, San José was initially (and temporarily) named the State’s capital. In the 1850s, the Gold Rush led to major changes in San José, which became a supply town for the prospectors who flooded the area (NPS, 2013). The population of the Santa Clara Valley expanded as a result of the Gold Rush, followed later by the construction of the railroad to San Francisco in 1864 and the completion of the transcontinental railroad in 1869. Former land grants were subdivided and sold to newcomers, with the Rancho Pastoria de las Borregas split between Murphy’s children and grandchildren following his death in 1892 (Thompson and West, 1876). Real estate developer W.E. Crossman purchased 200 acres of land, which eventually became Sunnyvale in 1901 (NPS, 2013).

Historically, the vicinity of the WPCP has been used for grazing and agriculture. During the Spanish and Mexican periods, the lands were likely used for cattle grazing, as part of the Rancho Pastoria de las Borregas. As the rancho was subdivided into increasingly smaller parcels following the annexation of California into the United States, crops and orchards were planted.

In 1912, the City of Sunnyvale incorporated with a population of approximately 1,500. Originally wastewater from Sunnyvale was disposed of by running a pipe to the San Francisco Bay. During the 1940s, the population of Sunnyvale grew to 10,000 and the City undertook studies to assess
the need for a citywide sewage treatment system. To service the needs of the growing population, the City constructed the existing WPCP on former agricultural fields beginning in 1954. The Primary Building, Digesters #1 and #2, and Sedimentation Basins #1 to #6 were completed at this time. The new plant could initially process 7.5 million gallons of wastewater a day. In 1962, the City completed construction to increase the treatment capacity to 15 million gallons per day. Further expansion included the purchase of a 115-acre pond from the Leslie Salt Company for use as an oxidation pond. Ultimately the City purchased a second evaporation pond of 325 acres that was converted to an additional oxidation pond. With the enactment of the Clean Water Act in 1972, new concepts were incorporated into wastewater treatment, resulting in expansion of the WPCP. When tertiary treatment was added to the WPCP in 1975, average dry weather flow capacity increased to 22.5 million gallons of treated wastewater each day. The final upgrade to increase the WPCP to its present average dry weather flow capacity of 29.5 million gallons of wastewater a day was completed in 1984 (City of Sunnyvale, 2014).

4.14.2.6 Existing Conditions

ESA completed a records search for the WPCP at the Northwest Information Center (NWIC) of the California Historical Resources Information System on June 9, 2014 (File No. 13-1889). The purposes of the records search were to: (1) determine whether known cultural resources have been recorded within or adjacent to the WPCP; (2) assess the likelihood for unrecorded cultural resources to be present based on historical references and the distribution of nearby sites; and (3) develop a context for the identification and preliminary evaluation of cultural resources. The records search consisted of an examination of the following documents:

- **NWIC digitized base maps** (USGS Mountain View 7.5-minute topographic maps), to identify recorded archaeological sites and studies within a 1-mile radius of the WPCP.

- **NWIC digitized base maps** (USGS Mountain View 7.5-minute topographic maps), to identify recorded historic-era resources of the built environment (building, structures, and objects) within a ¼-mile radius of the WPCP.

- **Resource Inventories**: California Inventory of Historical Resources, California Historical Landmarks, Historic Properties Directory for Sunnyvale (through April 2012).


- **Historic Maps**: An extensive on-line historic map collection with over 300 maps and views of California and Santa Clara County is available online at http://davidrumsey.com; Thompson and West (1876), *Historical Atlas Map of Santa Clara County, California*.

ESA completed a field survey of the WPCP on June 11, 2014. The entire WPCP was walked in narrow transects where feasible or observed from vantage points to provide an overall assessment of
site conditions. Photographs were taken throughout the main plant and oxidation ponds, especially of infrastructure within the main plant operational area dating from the original construction.

**Paleontological Assessment**

**Master Plan**

On a regional scale, fossilized plants, animals and microorganisms are prevalent throughout the Bay Area. For example, many of the hills in the Bay Area are made up of sedimentary bedrock that is known to contain a wide range of fossils, including radiolarians, mollusks, diatoms, foraminifers and non-marine vertebrates. In addition, even geologically young fluvial deposits have been known to contain fresh water mollusks and extinct late Pleistocene vertebrate fossils.

As noted above, the WPCP overlies young Holocene-age geologic units. Beneath a cap of artificial fill lay deposits of mud and silt associated with the present-day bay estuary (Bay Mud) and the distal edges of alluvial fans. These types of geologic deposits are too young (i.e., less than 10,000 years old) to have fossilized the remains of organisms, or to have preserved vertebrate fossils. While the Bay Mud may contain a variety of marine invertebrate remains and organic matter (mollusks, clams, foraminifera, microorganisms, etc.), such remains are not fossilized, are likely to exist in other Bay Mud deposits all around the Bay Area, and would not be considered significant or unique. For these reasons, in accordance with Society of Vertebrate Paleontology (1995) standards, the paleontological potential of the WPCP is considered low.

**Groundwater Replenishment Facilities**

The specific geologic context of the WPF is currently not known; the general vicinity contains areas of Holocene-age alluvial fans and Late Pleistocene-age alluvial deposits adjacent to the hillslopes of the eastern Santa Cruz Mountains. As noted above, Holocene-age deposits are too young (i.e., less than 10,000 years old) to have fossilized the remains of organisms, or to have preserved vertebrate fossils. Pleistocene-age deposits however do have the potential to contain fossils, including significant vertebrate fossils. The University of California Museum of Paleontology database lists 33 examples of vertebrate fossil discoveries in a Pleistocene-age context in Santa Clara County (UCMP, 2015). Based on the geologic framework and previous discoveries in Santa Clara County, the WPF has the potential for paleontological resources.

**Prehistoric Resources**

**Master Plan**

No prehistoric archaeological sites have been previously identified within the WPCP. Outside of the WPCP, two sites have been recorded within the ½-mile records search radius and two additional prehistoric sites are just outside the records search radius. These sites are over ½-mile inland from the tidal influences and marshlands of the historic shoreline of the San Francisco Bay. The Ynigo Mound is largest of these sites (CA-SCL-12/H) and contains at least two, possibly three, distinct occupation periods, numerous features, and a rich assemblage of prehistoric cultural materials including large quantities of shellfish, vertebrates, and carbonized plant remains. Several human burials have also been uncovered at the Ynigo Mound (Byrd, 2009; William Self, 2008).
Although no prehistoric archaeological resources have been recorded within the WPCP, the results of the records search show the potential for various types of unrecorded resources that could be identified in the general vicinity if any such resources were to exist. The WPCP is within an area of historic marshland that would have been utilized by prehistoric peoples for resource procurement including fish, shellfish, plants (especially tule), waterfowl, and sea mammals. The San Francisco Bay tidal marshes are part of the winter migratory route for ducks and geese. Prior to modern landfill projects, this salt marsh and wetland habitat was far more extensive.

A previous geoarchaeological study on the former Bay shoreline has concluded that the greatest potential for buried prehistoric archaeological sites in the Bay exists at the interface between the Bay Mud and the underlying strata, which represents the late-Holocene ground surface (i.e., pre-Bay inundation and sea level stabilization) (Rehor, 2008 in Hale and Rehor, 2011). Rehor notes “that it is on these buried land surfaces (paleosols) that archaeological deposits could have become buried during the sedimentation processes associated with rising sea levels” (Hale and Rehor, 2011:59). While some of the deeper excavations associated with Master Plan improvements may extend into alluvial deposits that have moderate archaeological potential, there is no indication from either nearby archaeological site distribution or from previous excavations at the WPCP that known or intact archaeological sites are present. Therefore, despite the general sensitivity of the vicinity for deeply buried archaeological resources, there appears to be a low possibility of encountering intact paleosols with cultural materials that date to the prehistoric period during ground disturbing activities associated with the Master Plan.

**Groundwater Replenishment Facilities**

Prehistoric archaeological sites in the southern San Francisco Bay Area tend to be located along the historic margins of San Francisco Bay, as well as near water sources, including streams and springs; along ridgetops and midslope terraces; and at the base of hills on alluvial flats. The specific locations of the pipelines and injection wells are currently not known; the general vicinity contains previously identified prehistoric archaeological sites.

The buried site potential of locations within the proposed WPF is varied, with Holocene-age alluvium being sensitive for buried sites. Other criteria used to measure the archaeological sensitivity of a given area include:

1) That archaeological sites tend to be located near perennial water sources;

2) That archaeological deposits from successive time periods are more common because the density of human populations increased over time; and

3) That the longer a landform remained at the surface, the greater the probability that any one spot on that landform was occupied [Meyer in Ruby, 2010:29].

Based on the geologic framework, proximity to perennial water sources, and previous discoveries in the general vicinity, the area where groundwater replenishment facilities could be sited has the potential for prehistoric archaeological resources.
Historic-period Resources

Master Plan

U.S. Fish and Wildlife Service (USFWS) historians evaluated the Alviso Salt Works potential eligibility for listing in the National Register of Historic Places (National Register) and the California Register of Historical Resources (California Register; USFWS, 2007) and completed a Historic American Landscapes Survey (HALS) of the Alviso Salt Works Historic District (USWFS, n.d.). The primary landscape characteristics of the Alviso Salt Works are the large evaporation ponds defined by levees. Small scale elements including pilings, remnant piers, small interior berms, and interior water control structures are also included as landscape features. The SCVWD Pond A4 is mapped within the boundaries of the landscape, although it is not listed as a specific feature and no small scale elements are identified within SCVWD Pond A4. Pond 1 and Pond 2 are not within the landscape boundary.

The Sunnyvale West and East Channels have been evaluated for their historic significance and were found to not be historical resources for the purposes of Section 106 of the NHPA or the California Environmental Quality Act (CEQA; SCVWD, 2013). No further consideration is necessary for the channels.

The WPCP was initially constructed in 1954 with expansions in 1962; therefore, original facilities dating to this period meet the minimum age threshold (45 years) for potential listing in the California Register, and could be considered historic properties if other criteria apply, such as a significant association with historical events, associations with important persons, or if it embodies the distinctive characteristics of a particular architectural style or represent the work of an important creative individual. Research completed for this Program Environmental Impact Report revealed no significant associations with historical events. Construction of the plant was a direct result of the need to service a growing post-war population, which was a typical trend on the local, state, and nationwide level. There is nothing to indicate that the initial construction or later expansion of the Sunnyvale WPCP was particularly unique or associated with important events in the history of the City or region. Research also revealed no associations with important local persons. Finally, the earliest construction at the WPCP consists of modern industrial facilities that were designed with more typical and utilitarian, rather than distinctive or unique, characteristics of the Mid-Century Modern architectural style, and would not be considered to embody the distinctive characteristics of this style or represent the work of an important creative individual. Additionally, the facility as a whole has been substantially altered within the last 45 years and does not retain sufficient integrity to convey any historic qualities. As such, there does not appear to be any buildings or structures within the WPCP that would qualify for listing in the National Register or the California Register; none of the building or structures would be considered “historical resources” as defined by CEQA.

Groundwater Replenishment Facilities

The specific locations of the pipelines and injection wells are currently not known; the City of Campbell has numerous historic architectural resources listed in local, State, and National
Registers. There is potential for the groundwater replenishment facilities to be adjacent to historic architectural resources.

4.14.3 Regulatory Setting

4.14.3.1 Federal Regulations

Cultural resources are considered through the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470f), and its implementing regulations. Prior to implementing an “undertaking” (e.g., federal funding or issuing a federal permit), Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties (i.e., properties listed in or eligible for listing in the National Register) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the National Register of Historic Places. Under the NHPA, a property is considered significant if it meets the National Register listing criteria at 36 CFR 60.4, as stated below:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:

a) Are associated with events that have made a significant contribution to the broad patterns of our history, or

b) Are associated with the lives of persons significant in our past, or

c) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or

d) Have yielded, or may be likely to yield, information important in prehistory or history.

Federal review of projects is normally referred to as the Section 106 process. This process is the responsibility of the federal lead agency. The Section 106 review normally involves a four-step procedure, which is described in detail in the implementing regulations (36 CFR Part 800):

Identify historic properties in consultation with the State Historic Preservation Officer (SHPO) and interested parties;

- Assess the effects of the undertaking on historic properties;
- Consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the Advisory Council on Historic Preservation; and finally,
- Proceed with the project according to the conditions of the agreement.
4.14.3.2 State Regulations

The State of California implements the NHPA of 1966, as amended, through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation, as an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The Office of Historic Preservation also maintains the California Historical Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state’s jurisdictions.

**California Environmental Quality Act**

The California Environmental Quality Act (CEQA), as codified in Public Resources Code (PRC) Sections 21000 et seq., is the principal statute governing the environmental review of projects in the state. CEQA requires lead agencies to determine if a proposed project would have a significant effect on historical resources, including archaeological resources. The CEQA Guidelines define a historical resource as: (1) a resource in the California Register; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency’s determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site may meet the threshold of PRC Section 21083 regarding unique archaeological resources. A unique archaeological resource is “an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria.

1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3) Is directly associated with a scientifically recognized important prehistoric or historic event or person” (PRC Section 21083.2 [g]).

CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064[c][4]).
California Register of Historical Resources

The California Register is “an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change” (PRC Section 5024.1[a]). The criteria for eligibility to the California Register are based on National Register criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for or listed in the National Register.

To be eligible for the California Register a historical resource must be significant at the local, state, and/or federal level under one or more of the following criteria.

1) Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.
2) Is associated with the lives of persons important in our past.
3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4) Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1[c]).

For a resource to be eligible for the California Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register.

4.14.4 Impacts and Mitigation Measures

4.14.4.1 Thresholds of Significance

For the purposes of this EIR, an impact related to cultural resources is considered significant if implementation of the Master Plan would:

- Cause a substantial adverse change in the significance of a built-environment historical resource as defined in CEQA Guidelines Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource that qualifies as a historical resource pursuant to CEQA Guidelines Section 15064.5[a], or as a unique archaeological resource as defined in Section 21083.2 of the Public Resource Code;
- Directly or indirectly destroy a unique paleontological resource or site or unique geological feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.
4.14.4.2 Approach to Analysis

Architectural/Structural Historical Resources

Potential impacts on architectural resources are assessed by identifying any Master Plan activities such as new construction, demolition, or substantial alteration that could affect resources that have been identified as historical resources for the purposes of CEQA. Individual properties and districts identified as historical resources under CEQA include those that are significant because of their association with important events, people, or architectural styles or master architects, or for their informational value (National Register and California Register Criteria A/1, B/2, C/3, and D/4) and that retain sufficient historic integrity to convey their significance. Criterion D/4 is typically applied to the evaluation of archaeological resources and not to architectural resources, as described below. Resources that meet the City’s criteria for a City Landmark may also be considered significant. Once a resource has been identified as significant, it must be determined whether the impacts of the project would “cause a substantial adverse change in the significance” of the resource (CEQA Guidelines Section 15064.5[b]). A substantial adverse change in the significance of a historical resource means “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of [the] historical resource would be materially impaired” (CEQA Guidelines Section 15064.5[b][1]). A historical resource is materially impaired through the demolition or alteration of the resource’s physical characteristics that convey its historical significance and that justify its inclusion in (or eligibility for inclusion in) the California Register or a qualified local register (CEQA Guidelines Section 15064.5[b][2]).

Archaeological Resources

The significance of most prehistoric and historic-period archaeological sites is usually assessed under National Register and California Register Criterion D/4. This criterion stresses the importance of the information potential contained within the site, rather than its significance as a surviving example of a type or its association with an important person or event. Archaeological resources may qualify as historical resources under the definition provided in CEQA Guidelines Section 15064.5[a], or they may also be assessed under CEQA as unique archaeological resources, defined as archaeological artifacts, objects, or sites that contain information needed to answer important scientific research questions (PRC Section 21083.2). A substantial adverse change in the significance of an archaeological resource is assessed similarly to other historical resources, i.e., by destroying or materially altering in an adverse manner those physical characteristics of the resource that convey its significance under the appropriate criteria (CEQA Guidelines Section 15064.5[b][2]).

Paleontological Resources

The paleontological analysis identifies the potential to encounter paleontological resources (i.e., plant, animal, or invertebrate fossils or microfossils) during excavations associated with the Master Plan. The paleontological potential of the geologic units to be disturbed is used to evaluate the potential to encounter paleontological resources at the location of each improvement or potential land use. A potentially significant impact on paleontological resources would occur
if: (1) construction of a Master Plan component would move or excavate previously undisturbed geologic bedrock (native rock) and/or (2) the bedrock to be disturbed has a high paleontological potential.

**Human Remains**

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including PRC Section 5097.98 and Health and Safety Code Section 7050.5. These laws are identified above in Section 4.14.3.2, State Regulations. This analysis considers impacts including intentional disturbance, mutilation, or removal of interred human remains.

### 4.14.4.3 Impact Summary

Table 4.14-1 lists the cultural resources impacts and significance determinations.

<table>
<thead>
<tr>
<th>Impacts</th>
</tr>
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<tbody>
<tr>
<td>CUL-1: Cause a substantial adverse change in the significance of an historical resource.</td>
</tr>
<tr>
<td>CUL-2: Cause a substantial adverse change in the significance of an archaeological resource that qualifies as a historical resource.</td>
</tr>
<tr>
<td>CUL-3: Directly or indirectly destroy a unique paleontological resource or site</td>
</tr>
<tr>
<td>CUL-4: Disturb any human remains, including those interred outside of formal cemeteries.</td>
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<thead>
<tr>
<th>Master Plan</th>
<th>LSM</th>
<th>LSM</th>
<th>LSM</th>
<th>LSM</th>
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<tbody>
<tr>
<td>Water Purification Facilities</td>
<td>LSM</td>
<td>LSM</td>
<td>LSM</td>
<td>LSM</td>
</tr>
</tbody>
</table>

LSM = Less than Significant impact with Mitigation required.

### 4.14.4.4 Master Plan Impacts and Mitigation Measures

**Impact CUL-1:** The project could result in a substantial adverse change in the significance of a historical resource, a less-than-significant impact with mitigation.

The Sunnyvale WPCP would not be considered an historical resource as it does not meet the criteria for eligibility for listing in the National Register or California Register. As such, any alterations or expansions to these facilities contemplated under the Master Plan would have no impact on historical resources as defined by CEQA Section 15064.5.

Most of the ponds surrounding the WPCP, however, are mapped within the boundaries of the Alviso Salt Ponds Historic District, which is eligible for listing in the National Register. The
primary landscape characteristics of the district are the large evaporation ponds defined by levees. Small scale elements including pilings, remnant piers, small interior berms, and interior water control structures are also included as landscape features.

Although Cargill Channel, which encompasses Pond 2 to the west, south, and east, is not within the SBSP Restoration Project Area, it has been used historically for solar salt production, and may contribute to a potential cultural landscape of South Bay salt ponds; the Channel was recently acquired by the USFWS. Cargill Channel has not been inventoried or systematically documented for its potential historic significance as a portion of a larger cultural landscape. As described in the South Bay Salt Pond (SBSP) Restoration Project Final EIR/EIS (EDAW, 2007), disturbance of the historic salt ponds of the South San Francisco Bay and associated structures that are considered a significant cultural landscape could have a significant impact (SBSP Impact 3.8-2). While the location configuration of the Diurnal Equalization and Emergency Storage Facilities is conceptual and subject to change, if the configuration involves construction in Pond 1 then road improvements would occur along the Cargill Channel. Road improvements to the existing road east of Cargill Channel as contemplated under the Master Plan could potentially affect the integrity of this historic landscape.

The SBSP EIR/EIS identified Mitigation Measure 3.8-2 (Cultural Landscape, Inventory of Resources, Treatment of Finds) to mitigate impacts to cultural landscapes to a less-than-significant level. Mitigation Measure 3.8-2 was partially fulfilled in 2009 when, as part of the SBSP Restoration Project, the USFWS prepared a cultural landscape report entitled Identification and Evaluation of the South San Francisco Bay Solar Salt Industry Landscape (Alameda, Santa Clara, and San Mateo Counties, California) For the Don Edwards San Francisco Bay National Wildlife Refuge and California Department of Fish and Game (USFWS, 2009). The report recommended that, “The Alviso Unit reflects the land use activities of salt production, the spatial organization (levees and ponds), and circulation patterns unique to the solar salt industry and should be treated as a historic district, meeting National Register eligibility Criterion A, with fair integrity.” As such, the “Alviso Salt Ponds Historic District” was identified as a cultural landscape eligible for listing in the National Register. Because it is eligible for the National Register it is also eligible for listing in the California Register, and is a historical resource for CEQA purposes. Mitigation Measure 3.8-2 further required that an assessment of effects on the district be conducted, including recommendations regarding any additional mitigation or treatment as needed. As part of the SBSP, USFWS historians completed Historic American Landscapes Survey documentation (USWFS, n.d.).

Components of the proposed Master Plan and associated road improvements may encroach upon Cargill Channel, a potential contributing element to the Alviso Salt Ponds Historic District. Impacts to the Channel could be potentially significant if they were to adversely affect the integrity of the Historic District.

Implementation of Mitigation Measure CUL-1 would ensure that impacts would be reduced to a less-than-significant level by requiring additional documentation of contributing elements to the Alviso Salt Ponds Historic District, as well as appropriate public interpretation efforts such as videotaping resources, a public outreach program, or signage.
Mitigation Measures

Mitigation Measure CUL-1. Assessment of Effects to Cargill Channel

Prior to implementation of the Diurnal Equalization and Emergency Storage Facilities project or other action that could affect the Cargill Channel, the City will retain a qualified historian or architectural historian to complete a specific assessment of effects of this action. If effects are found to be adverse, additional mitigation measures may be necessary, including supplemental Historic American Landscapes Survey documentation, as well as public interpretation efforts such as videotaping resources, a public outreach program, or signage at appropriate points near publically accessible viewsheds of Cargill Channel.

Conclusion: Less than Significant with Mitigation.

Impact CUL-2: The project could result in a substantial change in the significance of an archaeological resource, a less-than-significant impact with mitigation.

No archaeological resources were identified during the background research or field survey. The ground surface was entirely paved, built upon, and/or consisted of artificial fill. The oxidation ponds are underwater. Given the degree of previous disturbance within the WPCP and the limited ground visibility from existing infrastructure, this negative result is not surprising. Based on the historic use of the marshland and tidal areas of the San Francisco Bay, the known subsurface conditions at the main plant (artificial fill and Bay Mud to a depth of at least 13 feet below the ground surface), and previous disturbance associated with WPCP construction and dredging of the oxidation ponds, there appears to be a low potential for the discovery of archaeological resources. While some of the deeper excavations associated with Master Plan improvements may extend into alluvial deposits that have moderate archaeological potential, there is no indication from either nearby archaeological site distribution or from previous excavations at the WPCP that known or intact archaeological sites are present in the WPCP. Despite the lessened potential, the unanticipated discovery of archaeological resources or human remains cannot be entirely discounted. Impacts to archaeological resources would be potentially significant. Implementation of Mitigation Measure CUL-2 would reduce impacts to a less-than-significant level by ensuring appropriate treatment of accidentally discovered archaeological resources.

Mitigation Measures

Mitigation Measure CUL-2: Unanticipated Discovery of Archaeological Resources

If prehistoric or historic-period archaeological resources are encountered, all construction activities within 100 feet will halt and the City of Sunnyvale will be notified. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include deposits of metal, glass, and/or ceramic refuse. A Secretary of the Interior-qualified archaeologist will inspect
the findings within 24 hours of discovery. If it is determined that the project could damage a historical resource or a unique archaeological resource (as defined pursuant to the CEQA Guidelines), mitigation will be implemented in accordance with PRC Section 21083.2 and Section 15126.4 of the CEQA Guidelines, with a preference for preservation in place. Consistent with Section 15126.4(b)(3), this may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement. If avoidance is not feasible, a qualified archaeologist will prepare and implement a detailed treatment plan in consultation with City of Sunnyvale and, for prehistoric resources, the appropriate Native American representative. Treatment of unique archaeological resources will follow the applicable requirements of PRC Section 21083.2. Treatment for most resources would consist of (but would not be limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the project. The treatment plan will include provisions for analysis of data in a regional context, reporting of results within a timely manner, curation of artifacts and data at an approved facility, and dissemination of reports to local and state repositories, libraries, and interested professionals.

Conclusion: Less than Significant with Mitigation.

Impact CUL-3: The project could result in direct or indirect impacts on paleontological resources, a less-than-significant impact with mitigation.

While the paleontological sensitivity of the units underlying the site is low, there is a remote possibility that fossils may be discovered during excavations associated with components of the Master Plan. Because the significance of such fossils would be unknown until examined by a qualified paleontologist, such an event represents a potentially significant impact on paleontological resources. Implementation of Mitigation Measure CUL-3 would reduce impacts to a less-than-significant level by ensuring appropriate treatment of accidentally discovered paleontological resources.

Mitigation Measures

Mitigation Measure CUL-3: Unanticipated Discovery of Paleontological Resources

If paleontological resources, such as fossilized bone, teeth, shell, tracks, trails, casts, molds, or impressions are discovered during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a qualified paleontologist can assess the nature and importance of the find and, if necessary, develop appropriate treatment measures in conformance with Society of Vertebrate Paleontology standards, and in consultation with the City of Sunnyvale (or, for the WPF, the District).

Conclusion: Less than Significant with Mitigation.
4. Environmental Setting, Impacts, and Mitigation Measures

4.14 Cultural Resources

Impact CUL-4: The project could result in disturbance of human remains, a less-than-significant impact with mitigation.

Although unlikely, the discovery of human remains during construction of any Master Plan improvement or other proposed uses within the planning area that involves ground disturbance cannot be entirely discounted. Disturbance of human remains would be a potentially significant impact. To facilitate legal compliance, project personnel shall be alerted to the possibility of encountering human remains during construction, and apprised of the proper procedures to follow in the event they are found. Implementation of Mitigation Measure CUL-4 would reduce impacts to a less-than-significant level by ensuring appropriate treatment of accidentally discovered human remains.

Mitigation Measures

Mitigation Measure CUL-4: Unanticipated Discovery of Human Remains

In the event of discovery or recognition of any human remains during construction activities, such activities within 100 feet of the find will cease until the Santa Clara County Coroner has been contacted to determine that no investigation of the cause of death is required. The NAHC will be contacted within 24 hours if it is determined that the remains are Native American. The NAHC will then identify the person or persons it believes to be the most likely descendant from the deceased Native American, who in turn would make recommendations to the City of Sunnyvale (or, for the WPF, the District) for the appropriate means of treating the human remains and any grave goods.

Conclusion: Less than Significant with Mitigation.

4.14.4.5 Water Purification Facilities Impacts and Mitigation Measures

Impact WPF-CUL-1: The project could result in a substantial adverse change in the significance of a historical resource, a less-than-significant impact with mitigation.

The Sunnyvale WPCP would not be considered an historical resource as it does not meet the criteria for eligibility for listing in the National Register or California Register. As such, any alterations or expansions to these facilities contemplated under the Master Plan would have no impact on historical resources as defined by CEQA Section 15064.5. Therefore, implementation of the WPF at the main plant would not significantly affect historic resources.

The specific locations of the groundwater replenishment facilities are currently not known; the City of Campbell has numerous historic architectural resources listed in local, State, and National Registers. Without project-specific location information, there is the potential for the pipelines or wells to be adjacent to historical resources of the built environment. Impacts to historical resources would be considered potentially significant. To reduce potential impacts to historical resources to a less-than-significant level, the Santa Clara Valley Water District (District) shall implement Mitigation Measure WPF-CUL-1. This mitigation measure ensures that location
specific background research and surveys are completed following selection of WPF locations to determine if the proposed project would impact historical resources. Additional efforts would be required if historical resources could not be avoided during project implementation.

**Mitigation Measures**

**Mitigation Measure WPF-CUL-1: Project-Level Cultural Resources Assessment**

When project-level plans for the WPF are submitted, the District will retain a Secretary of the Interior-qualified archaeologist. Each proposed project location will be subject to a cultural resources investigation that includes, at a minimum, the following:

- A records search at the Northwest Information Center to identify cultural resources within or near the WPF location(s).
- If deemed warranted by the results of the records search, a surface survey of the proposed WPF location(s) to examine for the presence of cultural resources.
- A memorandum disseminating the results of the background research, field work, findings, and appropriate maps and photos.
- Site-specific measures to mitigate any adverse impacts to recorded and/or undiscovered cultural resources. Measures could include archaeological and Native American monitoring, redesign of the project to avoid known significant resources, or evaluation to determine the significance of newly discovered cultural resources.

**Conclusion:** Less than Significant with Mitigation.

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**Impact WPF-CUL-2: The project could result in a substantial change in the significance of an archaeological resource, a less-than-significant impact with mitigation.**

Impacts to archaeological resources associated with the WPF at the WPCP would be the same as those discussed above for the Master Plan facilities. Implementation of Mitigation Measure CUL-2 (Unanticipated Discovery of Archaeological Resources) above would reduce impacts to a less-than-significant level by ensure appropriate treatment of accidentally discovered archaeological resources.

The specific locations of the groundwater replenishment facilities are currently not known; the general vicinity contains previously identified prehistoric archaeological sites. Based on the geologic framework, proximity to perennial water sources, and previous discoveries in the general vicinity, the WPF has the potential for archaeological resources. Disturbance of known archaeological resources and/or unanticipated discovery of archaeological resources are impacts that would be considered potentially significant. To reduce potential impacts to archaeological resources to a less-than-significant level, the District will implement Mitigation Measure WPF-CUL-1. Mitigation Measure WPF-CUL-1 ensures that location specific background research and surveys are completed following selection of groundwater replenishment facilities locations to
4. Environmental Setting, Impacts, and Mitigation Measures

4.14 Cultural Resources

determine if the proposed project would affect archaeological resources. Additional efforts would be required if archaeological resources could not be avoided during project implementation.

**Mitigation Measures**

Implement Mitigation Measure WPF-CUL-1, Project-Level Cultural Resources Assessment and Mitigation Measure CUL-2, Unanticipated Discovery of Archaeological Resources.

**Conclusion:** Less than Significant with Mitigation.

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Impact WPF-CUL-3: The project could result in direct or indirect impacts on paleontological resources, a less-than-significant impact with mitigation.

Impacts to paleontological resources associated with the WPF at the WPCP would be the same as those discussed above for the Master Plan facilities. Implementation of Mitigation Measure CUL-3 (Unanticipated Discovery of Paleontological Resources) above would reduce impacts to a less-than-significant level by ensure appropriate treatment of accidentally discovered resources.

The specific geologic context of the groundwater replenishment facilities area is currently not known; the general vicinity contains areas of Late Pleistocene-age alluvial deposits. Pleistocene-age deposits have the potential to contain fossils, including significant vertebrate fossils. Based on the geologic framework and previous discoveries in Santa Clara County, the groundwater replenishment facilities have the potential for paleontological resources. Impacts to paleontological resources would be considered potentially significant. To reduce potential impacts to paleontological resources to a less-than-significant level, the District will implement Mitigation Measure WPF-CUL-3. This mitigation measure ensures that location specific background research is completed following selection of WPF locations to determine if the proposed project would affect paleontological resources. Additional efforts would be required if paleontological resources could not be avoided during project implementation.

**Mitigation Measures**

Implement Mitigation Measure CUL-3, Unanticipated Discovery of Paleontological Resources.

**Mitigation Measure WPF-CUL-3: Project-Level Paleontological Resources Assessment**

When project-level plans for the WPF are submitted, the District will retain a qualified paleontologist. Each proposed project location will be subject to a paleontological resources investigation that includes, at a minimum, the following:

- Background research at the University of California Museum of Paleontology database to identify paleontological resources within or near the WPF location(s).
- If deemed warranted by the results of the records search, a surface survey of the proposed WPF location(s) to examine for the presence of paleontological resources.
4. Environmental Setting, Impacts, and Mitigation Measures
4.14 Cultural Resources

- A memorandum disseminating the results of the background research, field work, findings, and appropriate maps and photos.
- Recommendations for additional paleontological resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered paleontological resources. Measures could include paleontological monitoring or redesign of the project to avoid known significant resources.

Conclusion: Less than Significant with Mitigation.

Impact WPF-CUL-4: The project could result in disturbance of human remains, a less-than-significant impact with mitigation.

During construction of the WPF at the WPCP that involves ground-disturbing activities, the discovery of human remains would be unlikely but cannot be entirely discounted, as discussed above for the Master Plan. Disturbance of human remains would be a potentially significant impact. Implementation of Mitigation Measure CUL-4 (Unanticipated Discovery of Human Remains), above, would reduce the impact to a less-than-significant level by ensuring appropriate treatment of accidentally discovered human remains.

The specific locations of the groundwater replenishment facilities are currently not known; the general vicinity contains previously identified prehistoric archaeological sites, some with human remains. Based on known prehistoric archaeological resources with burial locations in the general vicinity, there is the potential to uncover human remains. Impacts to human remains would be considered potentially significant. Implementation of Mitigation Measure WPF-CUL-1, (Project-Level Cultural Resources Assessment, discussed above under Impact WPF-CUL-1) will also reduce potential impacts to human remains. This mitigation measure ensures that location specific background research and surveys are completed following selection of groundwater replenishment facilities locations to determine if the proposed project would affect archaeological resources, including those with human remains. Additional efforts would be required if archaeological resources with human remains could not be avoided during project implementation. Implementation of Mitigation Measure CUL-4 and Mitigation Measure WPF-CUL-1 would reduce impacts associated with disturbance of human remains in the groundwater replenishment facilities area to a less-than-significant level.

Mitigation Measures

- Implement Mitigation Measure CUL-4, Accidental Discovery of Human Remains and Mitigation Measure WPF-CUL-1, Project-Level Cultural Resources Assessment.

Conclusion: Less than Significant with Mitigation.
**4.14.5 References Cited**


City of Sunnyvale, History of the Plant. Available on line at www.sunnyvale.ca.gov/Departments/EnvironmentalServices/WaterPollutionControlPlant.aspx, accessed June 2014.


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United States Fish and Wildlife Service (USFWS), *Identification and Evaluation of the South San Francisco Bay Solar Salt Industry Landscape (Alameda, Santa Clara, and San Mateo Counties,
4. Environmental Setting, Impacts, and Mitigation Measures

4.14 Cultural Resources


4.15 Aesthetics

This section addresses the potential aesthetic and visual quality impacts associated with implementation of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan (Master Plan) or Water Purification Facilities (WPF). Aesthetic resources, commonly referred to as visual resources, are defined as the visible natural and built landscape features that surround a project site. This section describes the existing visual setting in the vicinity of the WPCP and WPF groundwater replenishment facilities and evaluates the potential effects of the project on visual resources, including views from designated scenic roads, scenic areas, and public view corridors. Figure 4.15-1 is an aerial view of the WPCP showing the locations of photographs taken of the WPCP; these locations represent the viewpoints described in this section.

4.15.1 Setting

4.15.1.1 Definitions

Visual character, visual quality, and visual sensitivity are three terms used throughout this section and defined below:

- **Visual character** is the unique set of landscape features that combines to make a view, including native landforms, water, and vegetation patterns as well as built features such as buildings, roads, and other structures.

- **Visual quality** is the intrinsic appeal of a landscape or scene due to the combination of natural and built features in the landscape. Natural and built features combine to form unique perspectives with varying degrees of visual quality, which is rated in this analysis as high, moderate, or low.

- **Visual sensitivity** reflects the level of interest or concern that viewers and responsible land management agencies have for a particular visual resource with visual quality taken into account. Visual sensitivity is a measure of how noticeable proposed changes might be in a particular setting and is determined based on the distance from a viewer, the contrast of the proposed changes, and the duration that a particular view would be available to viewers. For example, areas such as scenic vistas, parks, trails, and scenic roadways typically have high visual quality and visual sensitivity because these locales are publically protected, appear natural, view durations are typically long, and close-up views are more commonly available.

4.15.1.2 Master Plan Setting

**WPCP**

Roadways in the vicinity of the WPCP include Carl Road and Borregas Avenue, providing primary access to the WPCP and a means by which the public can observe portions of the interior of the main plant. Views of the Master Plan area from other neighboring roadways are constrained by the presence of the Sunnyvale Landfill, which is now closed and maintained as open space and
Figure 4.15-1
Viewpoint Map

SOURCE: Google Maps; ESA

Sunnyvale Water Pollution Control Plant Master Plan . 120457
traversed by numerous trails. The closed landfill surrounds the main plant on the landward side (west, south and east). The WPCP is visible from the Bay Trail, which is adjacent to the main plant and encircles the oxidation ponds (Ponds 1 and 2), as well as trail segments at the closed landfill to the west of the main plant.

In terms of visual quality, the WPCP consists of two distinct elements: the main plant and Ponds 1 and 2.

Main Plant
As described above, Carl Road borders the main plant and provides primary access to the site. The WPCP is visible from surrounding trails. The periphery of the main plant consists of fencing, trees, shrubs, and urban landscaping. These partially screen views of the main plant from the adjacent roadway and trails. The approximately 16.6-acre main plant operational area contains the buildings and structures comprising treatment processes and support facilities (e.g., administration and maintenance), as shown on Figure 2-2 in Chapter 2, Project Background. The three fixed growth reactors, located at the northwest corner of the main plant, are round neutral colored concrete structures approximately 31 feet above grade. These are currently the tallest structures at the main plant. The air floatation tanks and digesters, located along the northern boundary of the main plant, are also round neutral colored concrete structures, approximately five feet and 21 feet above grade, respectively.

The remainders of the various facilities at the main plant are primarily one or two-story gray concrete and cinderblock square or rectangular buildings or structures, that give the site an industrial character. The current power generation facility, located along the northern boundary of the main plant, is approximately 25 feet above grade. The dewatering beds, which are located at the northeast corner of the main plant, are comprised of at-grade neutral colored structures and an adjacent disturbed dirt area. The existing administration and maintenance buildings, located along the southern boundary of main plant, are approximately 16 feet and 21 feet above grade, respectively. The filters, also located along the southern boundary of the main plant, are housed in a single-story structure approximately 17 feet above grade. The chlorine contact tanks are located at the southwest corner of the main plant and are approximately four feet above grade.

Ponds 1 and 2
Ponds 1 and 2 together have a total surface area of approximately 400 acres. There are also recirculation channels between Ponds 1 and 2. These features comprise a large open water habitat that provides opportunities for bird viewing and uninterrupted views of distant hills. The waters of the ponds and channel, the surrounding riparian vegetation, and the open space combine to create a high level of visual quality. There is an existing pond recirculation pump station facility along the berm between Ponds 1 and 2, and a neutral colored concrete pipeline (used for transfer of primary effluent) located above ground and adjacent to the berm south of the ponds.
**Land Surrounding the WPCP**

The surrounding land area is primarily used for industrial and recreational purposes. The Sunnyvale Materials Recovery and Transfer Station (SMaRT Station®), which consists of a two-story industrial style gray concrete and cinderblock building surrounded by a parking lot, abuts the main plant to the east. The Sunnyvale West Channel forms the main plant’s western boundary; the Sunnyvale East Channel borders the landfill farther east. The Moffett Channel is located north of the main plant. These channels are open water conveyance features for stormwater. The SCVWD Pond A4 is adjacent to Pond 1 and is a large open water habitat in the vicinity of the WPCP. Due to the proximity to the Don Edwards San Francisco Bay National Wildlife Refuge and including many natural features, the visual quality of the area surrounding the Master Plan area is considered moderate.

**Sensitive Viewer Groups**

Sensitive viewer groups within the vicinity of the Master Plan area include the recreationists using the Bay Trail and parts of other trails near the WPCP, as well as the motorists on Carl Road, Borregas Avenue and Caribbean Drive.

**Existing Visual Quality and Visual Sensitivity**

This section describes the visual quality and visual sensitivity of the Master Plan area from the above-described public viewpoints and sensitive receptors.

**View from Caribbean Drive**

From Caribbean Drive, motorists have short range views of commercial development and office parks to the south and the open space hills of the closed landfill to the north. The WPCP is largely not visible from Caribbean Drive because the open space hills in the foreground block the view, except for a small portion, just west of Borregas Avenue, including the top of the fixed growth reactor facilities at the main plant (see Figure 4.15-2, Photo 1). These facilities are generally blocked and minimally visible at roadway speeds, therefore the visual quality of this area is considered low and the visual sensitivity is also considered low.

**View from Borregas Avenue**

From Caribbean Drive, the WPCP entrance is located approximately 500 feet north on Borregas Avenue. Views from Borregas Avenue include open space hills of the closed landfill to the east (bordered by trees) and to the west. To the north and at the entrance to the WPCP, motorists on Borregas Avenue have views of the Administration Building, Primary Control Building, support facilities, trees, and landscaping (Photo 2). Trees provide a visual buffer between the roadways and the main plant facilities. The visual quality of this area is considered moderate; positive because of the open space, but negative because of the presence of the industrial facilities on the main plant site. Because of the industrial character of the main plant, the visual sensitivity from Borregas Avenue is considered moderate.
4. Environmental Setting, Impacts, and Mitigation Measures

4.15 Aesthetics

Sunnyvale Water Pollution Control Plant Master Plan

Draft EIR

Photo 1 – Main plant site looking north from Caribbean Drive. Refer to Figure 4.15-1 for location of photo viewpoint.

Photo 2 - WPCP entrance looking north from Borregas Avenue. Refer to Figure 4.15-1 for location of photo viewpoint.

Figure 4.15-2
Photos 1 and 2
View from Carl Road
The main plant is adjacent to Carl Road. The entrance to the Bay Trail is also located at the western terminus of Carl Road. Facilities along the eastern portion Carl Road (near the SMaRT Station®) consist of the Primary Control Building, the digesters, and the sludge dewatering area. Views of these facilities are partially screened by trees and sparse shrub vegetation, as shown in Figure 4.15-3, Photo 3. The west-facing views from Carl Road consist of the open space hills of the closed landfill to the west and south. Carl Road also offers partially screened views of the main plant facilities to the north as shown in Figure 4.15-3, Photo 4. Given the relatively flat topography, the presence of trees, and the existing main plant facilities, Ponds 1 and 2 are not visible from Carl Road. Because of the industrial character of the main plant, the visual sensitivity from Carl Road is considered moderate.

View from Bay Trail
Along the Bay Trail immediately adjacent to the main plant, there is a six foot high chain link fence bordered by shrubs and trees. The fixed growth reactors, air flotation tanks, digesters, and dewatering beds are the facilities at the main plant that are prominently visible from the Bay Trail immediately adjacent to the main plant. These facilities are partially screened by the existing vegetation and trees bordering the main plant site (refer to Photos 5, 6, 7, and 8 in Figures 4.15-4 and 4.15-5). Given the relatively flat topography and the presence of shrubs and trees, the views of the main plant are partially screened further north of on the Bay Trail, as shown in Figure 4.15-6, Photos 9 and 10. Uninterrupted views of the channels surrounding the main plant, SCVWD Pond A4, and Ponds 1 and 2 are provided from the Bay Trail north of the main plant site (Figure 4.15-7, Photo 11). The waters of the channels and ponds, the surrounding wetland vegetation, and the open space combine to create a high level of visual quality from this perspective. Because views of the main plant are screened by vegetation along the perimeter of the site, the visual sensitivity of the main plant from the Bay Trail is considered low to moderate.

View from Other Trails
From the trails on the closed landfill to the west of the WPCP, views consist of landscaping and trees, which partially screen the fixed growth reactors and the chlorine contact tanks at the main plant (see Figure 4.15-7, Photo 12). Recreationists also have elevated and open views of the channels, SCVWD Pond A4, and Ponds 1 and 2 (see Figure 4.15-8, Photo 13). At higher elevations of the trail, views of the channels and ponds remain uninterrupted, but due to the elevation change and landscaping, the views of the main plant are partially screened further west on the landfill trails, as shown in Figure 4.15-8, Photo 14. The waters of the channels and ponds, the surrounding riparian vegetation, and the open space combine to create a high level of visual quality from this perspective. However, because views of the main plant are screened by this vegetation along the perimeter of the site and decrease with increased elevation along the trails, the visual sensitivity of the portion of the main plant from this trail is considered low to moderate.
4. Environmental Setting, Impacts, and Mitigation Measures

4.15 Aesthetics

Photo 3 – View of digesters, landscaped edges and trees looking west from Carl Road. Refer to Figure 4.15-1 for location of photo viewpoint.

Photo 4 – View of closed landfill, landscaping and main plant facilities looking west along Carl Road. Refer to Figure 4.15-1 for location of photo viewpoint.

Figure 4.15-3
Photos 3 and 4
4. Environmental Setting, Impacts, and Mitigation Measures

4.15 Aesthetics

Sunnyvale Water Pollution Control Plant Master Plan

ESA | 130457
Draft EIR
February 2016

4.15-8

Photo 5 – View of Bay Trail entrance at western terminus of Carl Road, looking northeast toward main plant site. Refer to Figure 4.15-1 for location of photo viewpoint.

Photo 6 – View of main plant looking southeast from Bay Trail. Refer to Figure 4.15-1 for location of photo viewpoint.

Figure 4.15-4
Photos 5 and 6
4. Environmental Setting, Impacts, and Mitigation Measures

4.15 Aesthetics

Photo 7 – View of fixed growth reactors and main plant looking south from Bay Trail. Refer to Figure 4.15-1 for location of photo viewpoint.

Photo 8 – View of sludge dewatering beds, digesters and main plant from Bay Trail looking southwest. Refer to Figure 4.15-1 for location of photo viewpoint.

Figure 4.15-5
Photos 7 and 8
4. Environmental Setting, Impacts, and Mitigation Measures

4.15 Aesthetics

Photo 9 – View of main plant looking southeast from Bay Trail. Refer to Figure 4.15-1 for location of photo viewpoint.

Photo 10 – View of main plant looking south from Bay Trail. Refer to Figure 4.15-1 for location of photo viewpoint.

Figure 4.15-6
Photos 9 and 10
4. Environmental Setting, Impacts, and Mitigation Measures

4.15 Aesthetics

Photo 11 – View of Ponds 1 and 2 looking north from Bay Trail. Refer to Figure 4.15-1 for location of photo viewpoint.

Photo 12 – View of main plant looking east from trail at closed landfill. Refer to Figure 4.15-1 for location of photo viewpoint.

Figure 4.15-7
Photos 11 and 12
4. Environmental Setting, Impacts, and Mitigation Measures
4.15 Aesthetics

**Photo 13** – View of ponds and channels looking north from trail at closed landfill. Refer to Figure 4.15-1 for location of photo viewpoint.

**Photo 14** – View of main plant looking east from trail at closed landfill. Refer to Figure 4.15-1 for location of photo viewpoint.

**Figure 4.15-8**
Photos 13 and 14
4.15.1.3 Water Purification Facilities Setting

The proposed WPF include facilities at the WPCP as well as the groundwater replenishment facilities south of the WPCP (pipelines, injection wells, and existing recharge basins). The visual character of the WPCP is described above. The groundwater replenishment facilities area is defined by a combination of natural and man-made features and is comprised of a mostly developed urban area, with paved roadways and buildings. The area is relatively flat, allowing for expansive, uninterrupted views of the eastern foothills, the Santa Cruz Mountains to the southwest, and the Diablo Range to the northeast. The visual character is typical of cities within the Santa Clara Valley and contains developed land uses (residential, commercial, industrial, recreational, public, institutional, utility and transportation) located throughout the groundwater replenishment facilities area. Existing neighborhoods are primarily single family residential, often separated by major regional roadways and/or commercial strips. Along commercial corridors, existing shopping centers are focused on main streets.

Unique Scenic Resources

The groundwater replenishment facilities area is primarily suburban in character, with nodes of higher density, urban development. The unique scenic resources associated with each city within the groundwater replenishment facilities area are described below.

Sunnyvale: The City of Sunnyvale General Plan identifies Gateways and Visual landmarks throughout the city limits. Gateways are the primary locations where people enter and leave the city. Roadways at the City of Sunnyvale boundaries are defined as the Gateways (i.e., State Route 237 (SR 237), U.S. 101, El Camino Real, and Central Expressway). Visual landmarks within the City of Sunnyvale include Moffett Field, Lockheed, Libby Can Tower, Murphy Avenue, Water Tower, City Hall, and Freemont High School (City of Sunnyvale, 2011). Other visual resources include the Sunnyvale Baylands Park and wetlands preserve, Calabazas Creek and Saratoga Creek. Since only 10 percent of the San Francisco Bay’s wetlands remain, Sunnyvale Baylands Park and the wetlands preserve are invaluable resources for Sunnyvale and for the entire Bay Area region (City of Sunnyvale, 2011).

Santa Clara: The City of Santa Clara’s character and identity are largely products of its history as a Mission City. The city’s historic past is reflected through its historic resources, including Mission Santa Clara and numerous historic homes. Mission Santa Clara is the restored church of Mission Santa Clara de Asís. The Mission Church is open to the public and serves as the University chapel (City of Santa Clara, 2010). Other visual resources are the three seasonal creeks that run through the city (San Tomas Aquino, Saratoga and Calabazas Creeks).

San José: San José has a number of Gateway locations including Coleman Avenue at Interstate 880, 13th Street at U.S. 101, and U.S. 101 in the vicinity of the SR 85 Interchange. Topographic landmarks and features within the city of San José include Communications Hill, in the south central area of the city, the Silver Creek Hills in the southeast, and the Santa Teresa Hills in the southern portion of the city (City of San José, 2011). Major waterways within the city include the Guadalupe River, Coyote Creek, Los Gatos Creek, Silver Creek, and Penitencia Creek.
4. Environmental Setting, Impacts, and Mitigation Measures

4.15 Aesthetics

**Campbell:** Currently the City of Campbell is lacking Gateways at its boundaries and to most of its districts and neighborhoods (City of Campbell, 2014). Unique scenic resources within the city include Los Gatos Creek, San Tomas Aquino Creek, and District groundwater recharge basins.

**Cupertino:** The street over-crossing at Lawrence Expressway and Stevens Creek Boulevard is a definite Gateway to the east edge of Cupertino (City of Cupertino, 2014). Other visual resources include Stevens Creek, Calabazas Creek and McClellan Ranch Park.

**Saratoga:** SR 9 is officially designated as a State Scenic Highway Corridor from the Los Gatos city limit (east of Saratoga), through the Saratoga Village, to SR 35/Skyline Boulevard at the Santa Cruz County Line (i.e., at Saratoga Gap) (Caltrans, 2016; City of Saratoga, 2010). Other visual resources include Calabazas Creek and Los Gatos Creek.

**Existing Visual Quality and Visual Sensitivity**

**Pipeline Alignments**

Pipeline alignments would be located between the WPCP and the injection well siting area and the District’s recharge basins (refer to Figure 3-12 in Chapter 3, Project Description). Although the alignments for the proposed pipelines have not been identified to date, they would most likely be constructed within existing public streets. The visual character of the alignment areas along existing streets is mainly urbanized, surrounded by commercial and residential development, with man-made features and streetscapes and very little open space. Landscaping is typically minimal and mainly ornamental, including street trees. In general, commercial buildings are large and boxy in construction and are painted in neutral colors. Residential uses consist of single-family and multi-family houses fronting onto the streets. The buildings associated with the residential development range from one- to three-story buildings with landscaping.

**Injection Wells**

Although no specific sites will be identified until engineering feasibility studies are completed, preliminary injection well sites considered to date include open space, parks, public-use (i.e., schools), and residential parcels. As described above, the visual character of the groundwater replenishment facilities area is urban in nature. The open space/park areas are typically neighborhood-serving, surrounded by existing commercial and residential development, and paved roadways. The public use areas are located within the urban development areas, as they are intended to serve the surrounding community, and typically include buildings surrounded by landscaping (trees, bushes, and groundcover) and parking areas. Typical residential neighborhood character is described above.

**Recharge Basins**

The Los Gatos Groundwater Recharge System consists of recharge basins along Los Gatos Creek (refer to Figure 3-11). The recharge basins are shallow open water bodies that are surrounded by residential and industrial uses. The industrial uses include one- to two-story concrete buildings surrounded by parking lots and paved roadways, within minimal landscaping. Residences range from one- to three-story buildings with landscaping.
Sensitive Viewer Groups

The specific locations of the pipeline alignments and injection well sites in the groundwater replenishment facilities area is currently unknown; however sensitive viewer groups within this area would include individuals within residences and open space/park/trail users located along any of the pipeline routes or adjacent to the well sites. The sensitive viewer groups within the vicinity of the recharge basins include the residences adjacent to the basins and the users of the trails adjacent to the basins. The District recharge basin adjacent to the Los Gatos County Creek Trail is open for public use, while the other groundwater recharge basins in the City of Campbell are not currently available for public use or access.

4.15.1.4 Nighttime Light and Daytime Glare

Currently lights on poles (similar to streetlights) are operated at the main plant site at night to ensure safe access to facilities, as the plant is operational 24 hours per day. Current light sources within the WPF area include streetlights, lighting associated with commercial centers and residential lights.

4.15.2 Regulatory Setting

4.15.2.1 Federal Regulations

Consistent with the National Wildlife Refuge System Improvement Act of 1997, which requires that national wildlife refuges have a comprehensive conservation plan (CCP), the U.S. Fish and Wildlife Service (USFWS) has developed a CCP for the Don Edwards San Francisco Bay National Wildlife Refuge. The act provides the USFWS with guidance for managing refuges in a manner that ensures the long-term conservation of fish, wildlife, plants, and their habitats. The Final CCP, published in October 2012, outlines goals, objectives, and management strategies for the refuge to achieve during the 15-year life of the CCP (USFWS, 2012).

4.15.2.2 State Regulations

There are no highways near the WPCP that are eligible for designation as scenic highways or have been officially designated. As described above, SR 9 is officially designated as a State Scenic Highway Corridor.

4.15.2.3 Regional Plans

San Francisco Bay Conservation and Development Commission and the San Francisco Bay Plan

The San Francisco Bay Plan (Bay Plan) was prepared by the San Francisco Bay Conservation and Development Commission (BCDC) from 1965 through 1969 and amended periodically in accordance with the McAteer-Petris Act. The Bay Plan guides the protection and use of the Bay and its shoreline. BCDC has permit jurisdiction over shoreline areas subject to tidal action up to
the mean high tide line (including all sloughs, tidelands, submerged lands, and marshlands, as well as salt ponds and certain other areas that have been diked off from the San Francisco Bay) lying between the mean high tide and 5 feet above mean sea level for the nine Bay Area counties with bay frontage, and the land lying between the Bay shoreline and a line drawn parallel to, and 100 feet from, the Bay shoreline, known as the 100-foot shoreline band. Under the McAteer-Petris Act, the Bay Plan provides policy direction for BCDC’s permit authority regarding the placement of fill; extraction of materials; substantial changes in use of land, water, or structures within its jurisdiction; protection of the Bay habitat and shoreline; and public access to the Bay. Although the waters of Ponds 1 and 2 are not subject to BCDC’s Bay jurisdiction the way tidal waters are, any activities within 100 feet of Guadalupe Slough, Moffett Channel, and the tidal wetlands along the slough and channel are subject to BCDC’s shoreline band jurisdiction A BCDC permit would be needed for components of the Master Plan that fall within BCDC’s jurisdiction including diurnal equalization and storage, restoration of Ponds 1 and 2 (breaching of levees), relocated Bay Trail access, and improvements along the norther and western boundaries of the main plant. It is noted in the Bay Plan that if the oxidation ponds are not needed for sewage treatment purposes, then they should be acquired as a permanent wildlife area (BCDC, 2012, Map 7). BCDC policies that are relevant to scenic resources include the following (BCDC, 2012):

Appearance, Design, and Scenic Views Policy 2. All bayfront development should be designed to enhance the pleasure of the user or viewer of the Bay. Maximum efforts should be made to provide, enhance, or preserve views of the Bay and shoreline, especially from public areas, from the Bay itself, and from the opposite shore...

Appearance, Design, and Scenic Views Policy 8. Shoreline developments should be built in clusters, leaving open area around them to permit more frequent views of the Bay. Developments along the shores of tributary waterways should be Bay-related and should be designed to preserve and enhance views along the waterway, so as to provide maximum visual contact with the Bay.

4.15.2.4 Local Regulations

City of Sunnyvale General Plan

The Sunnyvale General Plan establishes the policy framework that serves as the City’s basis for decision-making, and guides the community’s near-term and long-range development. The goals and policies of the General Plan reflect the City’s philosophy on development and provide guidance for making decisions on related issues. The following policies regarding aesthetics are relevant to the Master Plan and WPF:

Policy CC-1.2. Continue to enhance the visibility, accessibility, and use of the San Francisco Bay on the City’s northern boundary.

Policy CC-2.1. Maintain and provide attractive landscaping in the public right-of-way to identify the different types of roadways and districts, make motorists more comfortable, and improve the enjoyment of residential neighborhoods.
Policy CC-4.1. Ensure that Sunnyvale’s public facilities are easily identified, accessible, attractive and representative of the community’s values and aspirations.

Citywide Design Guidelines

The Citywide Design Guidelines were adopted by City Council on June 23, 1992 and most recently amended on April 8, 2014 (City of Sunnyvale, 2014). The guidelines are applied to areas within the city that do not have specific design guidelines. They are based on General Plan goals and policies and mainly address development projects on private properties. The guidelines are intended to enhance the overall image of the city, protect and preserve the existing character of the community, communicate the image the community desires and achieve a higher design quality. The project would be required to comply with the guidelines including site design considerations such as locating noise and odor generating functions so that they do not create a nuisance for the adjacent properties.

4.15.3 Impacts and Mitigation Measures

4.15.3.1 Thresholds of Significance

For the purposes of this EIR, an impact related to aesthetics and visual resources is considered significant if implementation of the proposed project would result in any of the following:

- Substantial adverse effect on a scenic vista.
- Substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Substantial degradation of the existing visual character or quality of the site and its surroundings.
- A new source of substantial light or glare that would adversely affect day or nighttime views in the area.

4.15.3.2 Approach to Analysis

This section evaluates potential impacts on visual resources that could occur during project construction and operation of the proposed WPCP improvements. The visual analysis is based on field observations of the Master Plan area and surrounding vicinity; evaluations of aerial and ground-level photographs of the Master Plan area; evaluation of aerial images of the WPF groundwater replenishment areas; and information on the proposed Master Plan and WPF. As the locations of WPF injection wells and pipelines are not known, field observations were limited to areas surrounding the WPCP.

Permanent and temporary visual effects were assessed based on the potential of the Master Plan and WPF to substantially alter scenic resources or to degrade the visual character of the site. Actions such as building structures, grading roads, removing trees, and introducing new sources of light and glare can permanently alter the landscape in a manner that could affect the existing
visual character or quality of the area, depending on the perspective of the viewer. For this analysis it is conservatively assumed that all trees at the main plant site would be removed over the course of implementation of the Master Plan.

In determining impact potential and severity, the assessment considers the visual sensitivity of the Master Plan and WPF areas to accommodate the proposed physical changes and the contrast of those changes to the existing visual setting. This evaluation also considers temporary or short-term visual effects of construction activities that could substantially degrade the existing visual character or quality of the site or surrounding area, including the visibility of the Master Plan and WPF areas and the duration over which changes would take place.

For the reasons described below, there would be no impacts related to the following criteria:

**Threshold of Significance: Substantial adverse effect on a scenic vista**

There are no state- or locally-designated scenic vistas in the vicinity of the Master Plan area. Given the absence of designated scenic vistas in the area, construction and operation of Master Plan improvements would not result in a substantial adverse effect on a scenic vista. The pipelines associated with the WPF groundwater replenishment facilities would be placed below grade once complete and would not block scenic views. The proposed WPF injection wells would not include erecting structures that would block any scenic views, and the recharge basins are existing facilities that would essentially remain the same in appearance under implementation of the WPF. Therefore, the WPF would not result in a substantial adverse effect on a scenic vista. Therefore, this significance criterion does not apply to the Master Plan or WPF and is not discussed further.

**Threshold of Significance: Substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway**

The WPCP is visible from Carl Road, Borregas Avenue and Caribbean Drive. None of these roadways have been designated or are considered eligible to be state scenic highways, nor is the Master Plan area visible from a state scenic highway. Therefore, this significance criterion does not apply to the Master Plan.

There are scenic resources located throughout the groundwater replenishment facilities area, as described above in Section 4.15.1.3. The proposed pipelines would most likely be constructed within existing public streets. There is one roadway in the general vicinity of the groundwater replenishment facilities area that is designated scenic (SR 9), however this roadway is located over three miles south of the proposed pipelines, injection wells, and recharge basins. The injection wells would not be visible from SR 9 given their size and the distance to SR 9, and the pipelines would be underground. The proposed injection wells would most likely be located on existing developed parcels, and are not anticipated to affect any historic structures or scenic resources. The recharge basins would remain the same under implementation of WPF and therefore, this resource would not be affected. Therefore, this significance criterion does not apply to the WPF.
4.15.3.3 Impact Summary

Table 4.15-1 lists the project’s aesthetic impacts and significance determinations.

<table>
<thead>
<tr>
<th>Impact</th>
<th>AES-1</th>
<th>AES-2</th>
</tr>
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<tbody>
<tr>
<td>Degrade the existing visual character or quality of the site and its surroundings</td>
<td>LSM</td>
<td>LS</td>
</tr>
<tr>
<td>Create a new source of light or glare</td>
<td>LS</td>
<td>LS</td>
</tr>
</tbody>
</table>

LS = Less than significant impact, no mitigation required.
LSM = Less than Significant impact with Mitigation

4.15.3.4 Master Plan Impacts and Mitigation Measures

Impact AES-1: The Master Plan would change the existing visual character of the site, a less-than-significant impact with mitigation.

As noted above, in terms of visual quality, the WPCP consists of two distinct elements: the main plant, and the oxidation ponds. During construction of the various Master Plan improvements, the visual character of the site would be altered intermittently, particularly in areas outside of the main plant site. Due to the existing visual character of the site, the effects of Master Plan construction on the visual character of the area would be considered less than significant. The following discussions describe the effects of the Master Plan on visual character after construction.

Main Plant

All proposed structures associated with the main plant would be primarily gray concrete and cinderblock structures or buildings, similar to the existing structures. The current plant has an industrial character, despite the presence of trees along the northern and western edges of the main plant site.

The proposed new facilities at the main plant most visible from Borregas Avenue and Carl Road would include the aeration blower building (approximately 25 feet above grade), biosolids Thickening/Dewatering Facility (approximately 50 feet above grade), digested sludge storage tank (approximately 25 feet above grade), phosphorus recovery facility (approximately 15 feet above grade), FOG/Food Waste Facility (approximately five feet above grade), biosolids post processing facility (approximately 25 feet above grade), filter control building (approximately 20 feet above grade), dual media filters (approximately five feet above grade), denitrification
filters (approximately five feet above grade), Administration Building (approximately 40 feet above grade), and Maintenance Building (approximately 30 feet above grade). The proposed biosolids Thickening/Dewatering Facility and the new Administration Building would exceed the height of the current existing structures. However, landscaping planted along the fenceline would partially screen views of these structures from Borregas Avenue and Carl Road. In addition, these new facilities would be consistent with the existing industrial nature of the main plant site and these facilities would not be visible to motorists on nearby Caribbean Drive due to the intervening landfill topography.

Tree removal along the northern and western boundaries of the main plant, which would be most visible from the Bay Trail, could occur along with rehabilitation of the fixed growth reactors (2015-2020) or later, depending upon implementation of additional tertiary treatment facilities. Once constructed, the proposed new facilities at the main plant most visible from the adjacent Bay Trail would include the UV disinfection facilities (approximately five feet above grade), microfiltration facility for recycled water (approximately 20 feet above grade), secondary clarifiers and pump station (approximately five feet above grade), power generation facility (approximately 20 feet above grade), gas treatment facility (approximately 15 feet above grade), and aeration basins (approximately 15 feet above grade). These facilities would not exceed the height of the current existing structures, and some facilities visible from the adjacent Bay Trail would actually be lower in height than existing facilities. Given (a) the limited publicly accessible viewpoints of the main plant, (b) the existing visual character of the site (see Figure 4.15-7, Photo 12), and (c) the anticipated future appearance of proposed facilities, implementation of the Master Plan would not substantially degrade the visual character of the main plant. For these reasons, impacts would be less than significant.

In addition, as described in Chapter 6, Cumulative Impacts and Other CEQA Issues, the District plans to construct a floodwall between the main plant and the Bay Trail by 2019, which could further limit the visibility of the main plant regardless of tree removal.

**Ponds 1 and 2**

Diurnal equalization and emergency storage facilities would be constructed within the existing oxidation ponds (shown in Photos 11 and 13, Figures 4.15-7 and 4.15-8, respectively). Facilities associated with these components include: improvements to the existing access road to the ponds; improvements to raise and fortify existing berms; equalization tanks; earthen storage basins; an equalization pump station; and a new section of pipeline to connect the existing primary effluent pipeline to the equalization tanks (assumed to be installed within the access road). The access road would be raised approximately six feet, for a total height of 16 feet above sea level. The finished road surface would most likely be similar in appearance to the existing access road. Views from the existing trail are expansive; long-range views include views north and east to hills across the Bay; near-range views include the marshes and waters of the channels and ponds, with trees along portions of the eastern side of trail forming a visual boundary. The open space, wetland vegetation and waters within the channels combine to create a high level of visual quality along stretches of the Bay Trail (as shown in Figure 4.15-6, Photos 9 and 10).
Elevating and broadening the access road would change the view angle and near-range perspective somewhat and encroach into adjacent portions of Moffett Channel, Cargill Channel and potentially the Sunnyvale West Channel (as shown in Figure 4.7-1). The proposed vegetation removal and filling of areas adjacent to the existing access road, combined with the change in the height and width of the access road, could incrementally degrade the visual character of the trail’s near-range view corridor. Implementation of Mitigation Measure BIO-3a (Avoidance of Open Water and Wetland Habitats), would mandate that impacts to wetlands/waters of the U.S. be avoided to the extent feasible. However, some change to the near-range views of wetlands would occur, even with implementation of this mitigation measure. Widening the access road would remove an estimated 1.5 acres of marsh from Moffett Channel. Moffett Channel ranges in width along the proposed access road from approximately 180 feet to approximately 280 feet. With the Master Plan, the extent of Moffett Channel marsh and waters within near-range views would decrease by approximately 20-25 percent. The extent of open water visible in Cargill Channel could be reduced by an estimated 2.5 acres. Implementation of the Master Plan would thus alter the visual quality of Moffett Channel and Cargill Channel. Implementation of Mitigation Measure AES-1, Levee Plantings and Visual Screening, would reduce the impact of the access road on near-range visual quality to less-than-significant levels by planting along the access road vegetation in a manner that does not compromise the integrity of the road as a flood protection structure.

The emergency storage basins would be located at grade. The equalization tanks and pump station would be approximately 20 feet above grade. The equalization tanks and pump station would introduce new manufactured industrial elements that would contrast with the natural features and change the appearance of the oxidation ponds, which would change the existing visual character and quality of the site. As shown in Photo 11 and Photo 13, above, the current views of the oxidation ponds and surrounding channels from the trails are considered high quality. These facilities would alter the existing open water feature and cause disrupted views of the surrounding landscape. The facilities would exceed the height of the proposed access road by three feet and would be especially visible from the immediate vicinity along the Bay Trail. This would be considered a significant impact. Implementation of Mitigation Measure AES-1 would reduce this impact to a less-than-significant level by providing visual screening of these facilities.

**Mitigation Measures**

**Mitigation Measure AES-1: Levee Plantings and Visual Screening**

The design of the access road and levee will include landscape plantings. Planting design will retain safety, structural integrity, and functionality of the access road and levee, and accessibility for maintenance, inspection, monitoring, and flood control. Design of the landscape plantings and vegetation management program will be coordinated with a civil engineer and landscape architect, along with the District and the City of Sunnyvale, to ensure that landscaping and maintenance practices chosen are ecologically compatible, feasible, and compatible with flood damage protection. The levee planting plans chosen for implementation will be certified by a registered professional engineer to ensure reliable operation and maintenance of the access road and levee and reviewed by a qualified biologist to ensure compatibility of the plants with the existing plant mosaic.
The Master Plan will also include fencing around the proposed equalization tanks and pump station. The fencing will be of sufficient height to block views of these facilities (i.e., six to eight feet above grade) and include aesthetic treatment to make the structure less visually obtrusive and blend in with the surrounding background. Possible aesthetic treatment can include architectural features such as color application, surface texture and pattern treatment.

**Conclusion:** Less than Significant with Mitigation.

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**Impact AES-2:** The Master Plan would not create a new source of light or glare, a less-than-significant impact.

Currently lights on poles (similar to streetlights) are operated at the Master Plan site at night to ensure safe access to facilities, as the plant is operational 24 hours per day. Similar lighting would be installed on or around the facilities on the main plant site to afford security cameras adequate lighting for 24 hour surveillance of the new facilities. There are no nearby residents that would be affected by proposed lighting. The potential impact of light and glare would be less than significant.

**Mitigation:** None required.

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**4.15.3.5 Water Purification Facilities Impacts and Mitigation Measures**

**Impact WPF-AES-1:** The WPF would not degrade the existing visual character of the site, a less-than-significant impact.

**WPF at the WPCP**

The new facilities at the main plant to support the WPF would include membrane bioreactors, reverse osmosis (RO), ultraviolet (UV) disinfection and advanced oxidation. The membrane bioreactor facilities would be located at the northeast corner of the plant and include rectangular structures a maximum of 20 feet high. The RO, UV disinfection and advanced oxidation facilities would be located at the northwest corner of the main plant and include rectangular structures approximately 25 feet and 15 feet high.

The new facilities at the WPCP to support the WPF would not exceed the height of the facilities and would be similar to the existing industrial visual character of the WPCP facilities, and therefore would not be expected to degrade the visual character of the site. Construction impacts would be similar to those described above for the Master Plan. For these reasons, impacts would be less than significant.
4. Environmental Setting, Impacts, and Mitigation Measures

4.15 Aesthetics

**Pipelines**

Although the alignments for the proposed pipelines have not been identified to date, they would most likely be constructed within existing public streets. Construction of the proposed project would be visible from nearby residential and commercial uses and would involve temporary negative aesthetic affects, including open trenches as well as the presence of construction equipment and materials. Construction impacts would be temporary and are considered to be less than significant. Once built, the pipeline would be buried underground and not visible. The visual character of the pipeline alignment would be the same before and after construction. Operation and maintenance of the pipelines would not affect any visual resources. For these reasons, impacts would be less than significant.

**Injection Wells**

Based on the relative flat topography of the groundwater replenishment facilities area, views from existing parcels would be limited to the immediately surrounding area. Construction of the injection wells would be visible from nearby uses and would involve temporary negative aesthetic affects, including the presence of construction equipment and materials. Construction impacts would be temporary and are considered to be less than significant. When finished, each injection well would consist primarily of a concrete pad approximately 400 square feet with pipeline connections. These would introduce a new industrial element into the existing visual environment. However, based on the small size of the proposed facility, the limited visibility, as well as the current developed and urban nature of the area surrounding the proposed injection well sites, these facilities would not be expected to substantially alter the existing visual character of the sites and their surrounding area. Therefore, the impact would be considered less-than-significant. Because the wells could occur on a variety of land use parcels, when project-level CEQA review is initiated, the District will review this analysis in light of the specific well locations’ potential to degrade the existing visual character or quality of the site and its surrounding, and update analyses accordingly.

**Recharge Basins**

The recharge basins proposed for use under the WPF are existing District facilities and do not include public access trails adjacent to them and are only visible to the immediately surrounding residences. With implementation of the WPF, the groundwater recharge basins would not change and would continue to be in operation and use of storage for groundwater. As operations would not change under the WPF, views of these basins from the surrounding residences would not change and the impact would be less than significant. Construction impacts associated with the pipeline connections are described above, and would be temporary and are considered to be less than significant.

**Mitigation:** None required.
Impact WPF-AES-2: The WPF would not create a new source of light or glare, a less-than-significant impact.

Lighting for WPF facilities at the WPCP would be as described in Impact AES-2, a less than significant impact. There would be no lighting associated with the WPF groundwater replenishment facilities. Therefore, operation of these facilities would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. If nighttime construction is required, construction crews working at night would direct any artificial lighting onto the work area to minimize the spillover of light or glare onto adjacent areas. The potential impact of light and glare would be less than significant.

Mitigation: None required.

4.15.4 References


4.16 Energy Conservation

This section identifies and evaluates energy conservation-related impacts that could result from implementation of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan and the Water Purification Facility (WPF). Discussed are the environmental and regulatory setting, the analytical baseline, the criteria used for determining the significance, and potential impacts associated with the implementation of the Master Plan or WPF. The analysis qualitatively assesses the Master Plan’s impacts on local and regional energy supplies and consistency with federal, state, and local energy conservation policies.

4.16.1 Setting

4.16.1.1 Regional and Local Setting

Energy Production and Distribution in California

Forms of energy generated or obtained within California include: fossil fuel, hydroelectric, nuclear, renewable resources, electricity; natural gas; and petroleum. California’s energy system provides 71 percent of the electricity, 12 percent of the natural gas, and 38 percent of the petroleum consumed in or used for the state. The rest of the state’s energy is imported, and includes electricity from the Pacific Northwest (8 percent, primarily hydroelectric) and the Southwest (21 percent, primarily coal and nuclear); natural gas purchases from Canada (22 percent), the Rocky Mountain States (23 percent), and the Southwest (42 percent); and crude oil imported from Alaska (12 percent) and foreign sources (50 percent) (California Energy Commission [CEC], 2011).

The production of electricity requires the consumption or conversion of energy resources including water, wind, oil, gas, coal, solar, geothermal, and nuclear sources. Of the electricity generated in-state, 53.4 percent is generated by natural gas-fired power plants, 1.7 percent is generated by coal-fired power plants, 14.6 percent comes from large hydroelectric dams, and 15.7 percent comes from nuclear power plants. The remaining in-state total (14.6 percent) electricity production is supplied by renewable sources (CEC, 2011).

The electricity generated and used in California is distributed via a network of high voltage transmission lines commonly referred to as the power grid.

Local Utility Energy Production and Distribution

Electricity is provided to the Master Plan and WPF areas by the Pacific Gas and Electric Company (PG&E). PG&E provides service to approximately 13 million people throughout a 70,000 square mile service area in Northern and Central California. PG&E’s service area extends from Eureka to Bakersfield (north to south), and from the Sierra Nevada to the Pacific Ocean (east to west). PG&E produces and purchases energy from a mix of conventional and renewable generating sources, which travel through its electric transmission and distribution systems to reach customers. Table 4.16-1 shows the electric power mix that PG&E delivered to its retail customers in 2011.
4. Environmental Setting, Impacts, and Mitigation Measures

4.16 Energy Conservation

TABLE 4.16-1
PG&E’S 2011 ELECTRIC POWER MIX DELIVERED TO RETAIL CUSTOMERS

<table>
<thead>
<tr>
<th>Power Source</th>
<th>Percent of Total Power Mix Delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>22</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>25</td>
</tr>
<tr>
<td>Large Hydroelectric</td>
<td>18</td>
</tr>
<tr>
<td>Coal</td>
<td>0</td>
</tr>
<tr>
<td>Unspecified Sources</td>
<td>15</td>
</tr>
<tr>
<td>Eligible Renewables</td>
<td>19</td>
</tr>
</tbody>
</table>


Existing WPCP Energy Demand

For the year 2012, the annual energy demand of the WPCP was 10,160 megawatt hours (MWh). Of that total energy required to run the WPCP, an average of 1,087 kilowatt hours (kWh) energy was produced by the onsite cogeneration facility and an additional 73 kWh of electricity was supplied by PG&E (Carollo, 2014).

Existing WPCP Energy Supply

The Sunnyvale WPCP generates onsite nearly all (94 percent) of the electricity required to operate plant facilities. The PGF generates power using gas-fueled generators. The engines burn a combination of onsite-generated digester gas and landfill gas from the surrounding landfill, supplemented with natural gas purchased from PG&E. The amount of natural gas used varies and depends on the amount of digester gas and landfill gas available and their heating value, both of which vary on a daily basis. In 2012, the PGF used approximately 150,000 standard cubic feet per day of air blended natural gas (CDM Smith, 2013). In addition to generating electricity, the PGF engines provide waste heat for use in plant processes (cogeneration) such as the digesters. The system includes three engine-generator sets (two 700-kW units and one 1,200 kW unit) in the Pump and Engine building, three engine-generator sets (each 2,500 kW units) in Building 40 located in the northwest corner of the WPCP operations area, and one Fuel Cell that can supply 1,400 kW. Combined, the engine-generators are capable of producing approximately 12 MW of electricity. Normally, the engine-generator sets meet the full electricity demand at the WPCP. This is typically accomplished by using one or two 800 kW engine-generator sets, one 1,750 kW set, and two 2,800 kW sets, resulting in a total output of approximately 8,000 kW (one or two units are typically on standby). The imported electricity is provided by PG&E via two 115 kilovolt (kV) overhead power lines which connect to two 115 kV substations within the WPCP.
4.16.2 Regulatory Setting

4.16.2.1 Federal Regulations

Energy Policy and Conservation Act

The Energy Policy Act of 1975 was established in response to the oil crisis of 1973, which increased oil prices due to a shortage of reserves. The Energy Policy Act required that all vehicles sold in the U.S. meet certain fuel economy goals. The corporate average fuel economy (CAFE) standard for new passenger cars was 27.5 miles per gallon (mpg) from 1990 to 2010, and the CAFE standard for new light trucks (gross vehicle weight of 8,500 pounds or less) grew slowly from 20.0 to 23.5 mpg over the same time period. For model year 2011, these standards were raised to 30.2 and 24.1 mpg, respectively, and recent legislation continues to raise these standards for each future model year. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not subject to CAFE standards. The Energy Policy Act indirectly applies to the proposed Master Plan due to its effects on vehicle fuel efficiencies for the vehicles to be used during construction.

Energy Policy Act of 2005

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, buying hybrid vehicles, building energy efficient buildings, and improving the energy efficiency of residential and commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

4.16.2.2 State Regulations

State of California Integrated Energy Policy

In 2002, the Legislature passed Senate Bill 1389, which required the CEC to develop an integrated energy plan biannually for electricity, natural gas, and transportation fuels, for the California Energy Report. The plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for Zero Emission Vehicles and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled and accommodate pedestrian and bicycle access.

to achieve policy goals for energy efficiency, renewable energy and reduced greenhouse gases; and securing the economic development benefits of the clean energy economy by strategically targeting state funding investments for energy efficiency, renewable energy, the smart grid, alternative and renewable transportation fuels, and research and development to create jobs and leverage additional private investment.

**California Energy Action Plan**

California’s 2008 Energy Action Plan Update updates the 2005 Energy Action Plan II, which is the State’s principal energy planning and policy document (California Public Utilities Commission [CPUC] and CEC, 2008). The plan maintains the goals of the original Energy Action Plan, describes a coordinated implementation plan for state energy policies, and identifies specific action areas to ensure that California’s energy is adequate, affordable, technologically advanced, and environmentally sound. First-priority actions to address California’s increasing energy demands are to promote energy efficiency, demand response (i.e., reducing customer energy usage during peak periods to address power system reliability and support the best use of energy infrastructure), and use of renewable power sources. To the extent that these strategies are unable to satisfy increasing energy and capacity needs, the plan supports clean and efficient fossil-fuel fired generation.

**Title 24 - California Energy Efficiency Standards**

The Energy Efficiency Standards for Residential and Nonresidential Buildings specified in Title 24, Part 6 of the California Code of Regulations were established in 1978 in response to a legislative mandate to reduce California’s energy consumption. The standards are updated periodically to allow for consideration and possible incorporation of new energy-efficiency technologies and methods. The California Energy Commission adopted an update to its standards in 2013, and the new standards became effective on January 1, 2014 (CEC, 2012). These new standards are expected to be 25 percent more efficient than previous standards for residential construction and 30 percent better for nonresidential construction, offering builders better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption in homes and businesses.

**4.16.2.3 Local Plans and Policies**

Most of the activities associated with the Master Plan would take place at the WPCP and would therefore fall under the jurisdiction of the City of Sunnyvale. However, pipeline alignments, recharge basins and injection wells associated with the WPF could fall with the jurisdictions of other cities south of the WPCP. Existing recharge basins that could be used for groundwater replenishment are located within the City of Campbell. The District has not determined the specific location of injection wells or pipelines, but these components of the WPF could be located in the Cities of Sunnyvale, San Jose, Campbell, Cupertino, Saratoga, and/or Santa Clara. Goals and policies from these jurisdictions that relate to energy use and conservation are presented below. As indicated in Section 4.2, Land Use, general plan consistency determinations for the WPF would be advisory (consistent with California Government Code Section 65402(c)).
City of Sunnyvale

The City of Sunnyvale General Plan contains the following goal and policies associated with energy conservation (City of Sunnyvale, 2011):

Citywide Vision Goal III: Environmental Sustainability - To promote environmental sustainability and remediation in the planning and development of the City, in the design and operation of public and private buildings, in the transportation system, in the use of potable water and in the recycling of waste. Through this vision, the City seeks opportunities to utilize “green” practices in its operation and delivery of services, and encourage residents and businesses to adopt such practices. These might include reduced use of non-renewable energy, reduced emissions of greenhouse gases, greater recycling of waste and use of recycled materials, reduced per-capita use of potable water, green building design and reduced stormwater runoff.

- **Policy EM-7.2:** Coordinate operating procedures with the City energy policy to optimize an alternative energy program so that minimum use and reliance are placed on outside energy sources.
- **Policy HE-6.6:** Encourage use of sustainable and green building design in new and existing housing.

City of Sunnyvale Sustainability Policy

Sunnyvale has adopted a sustainability policy to become “a regional leader in environmental sustainability, advocating to reduce dependence on non-renewable resources by providing greater transportation options, reducing waste, protecting our natural resources, and promoting alternative energy usage and research.” The structure for implementation of this policy is set forth in Sunnyvale’s Framework for Sustainability, with the City’s various environmental activities coordinated through the City’s Sustainability Coordinator. The Community Vision also contains a Citywide goal for environmental sustainability.

Green Building Requirements

The green building standards for new construction, additions, and remodels of buildings were effective for all projects that submit building permits on or after January 1, 2010. The purpose of these standards is to implement sustainable development and construction practices that

- Use natural resources in a manner that does not eliminate, degrade, or diminish their usefulness for future generations
- Enhance the public health and welfare by promoting the environmental and economic health of the City through the design, construction, maintenance, operation, and deconstruction of buildings and other site development
- Incorporate green building practices into all development projects.
City of San Jose

The City’s Envision San José 2040 General Plan contains goals and policies associated with energy conservation, which are summarized below (City of San Jose, 2011):

**Goal MS-14: Reduce Consumption and Increase Efficiency.** Reduce per capita energy consumption by at least 50 percent compared to 2008 levels by 2022 and maintain or reduce net aggregate energy consumption levels equivalent to the 2022 (Green Vision) level through 2040.

*Policy MS-14.4:* Implement the City’s Green Building Policies so that new construction and rehabilitation of existing buildings fully implements industry best practices, including the use of optimized energy systems, selection of materials and resources, water efficiency, sustainable site selection, passive solar building design, and planting of trees and other landscape materials to reduce energy consumption.

*Policy MS-14.5:* Consistent with State and Federal policies and best practices, require energy efficiency audits and retrofits prior to or at the same time as consideration of solar electric improvements.

**Goal MS-15: Renewable Energy.** Receive 100 percent of electrical power from clean renewable sources (e.g., solar, wind, hydrogen) by 2022 and to the greatest degree feasible increase generation of clean, renewable energy within the City to meet its own energy consumption needs.

*Policy MS-15.2:* Lead globally in adopting technologies that transform solid waste and biosolids (i.e., the solids that remain after wastewater treatment) into usable energy.

*Policy MS-15.5:* Showcase and apply innovative technologies within San José, including developments that achieve maximum energy efficiency or net zero energy, and renewable energy systems that generate energy equal to or greater than that consumed on site.

*Policy MS-15.6:* Utilize municipal facilities to showcase the application of outstanding, innovative, and locally developed energy efficiency and renewable energy technologies and practices, to demonstrate the effectiveness of these technologies and to highlight the City’s energy leadership.

City of Campbell

The City of Campbell General Plan contains the following policies relevant to energy (City of Campbell, 2001):

**Goal CNR-1: Promote energy conservation in Campbell.**

*Policy CNR-12.1: Energy Consumption.* Reduce City government energy consumption.

*Policy CNR-12.2: Advanced Energy Technology and Building Materials.* Facilitate the use of advanced energy technology and building materials to create energy-efficient residences and buildings.
Policy CNR-12.3: Landscaping Requirements Continue to enforce landscaping requirements that facilitate energy efficient use or conservation.

City of Cupertino

General Plan goals and policies relevant to energy include the following (City of Cupertino, 2014):

Goal ES-1: Ensure a sustainable future for the City of Cupertino.

Goal ES-2: Promote conservation of Energy resources.

Policy ES-2.1: Conservation and Efficient Use of Energy Resources. Encourage the maximum feasible conservation and efficient use of electrical power and natural gas resources for new and existing residences, businesses, industrial and public uses.

Goal ES-3: Improve building efficiency.

Policy ES-3.1: Green Building Design. Set standards for the design and construction of energy and resource conserving/efficient building.

City of Saratoga

The City of Saratoga General Plan contains the following energy goals and policies (City of Saratoga, 2007):

Goal LU 6: Protect natural resources and amenities through appropriate land use and related programs.

Policy 6.5: Encourage the use of renewable resources and energy conservation.

City of Santa Clara

The City of Santa Clara General Plan contains the following energy goals and policies (City of Santa Clara, 2010):

Goal 5.10.3-G1: Energy supply and distribution maximizes the use of renewable resources.

Goal 5.10.3-G2: Implementation of energy conservation measures to reduce consumption.

Goal 5.10.3-G3: Adequate energy service to residents, businesses, and municipal operations.

Policy 5.10.3-P1: Promote the use of renewable energy resources, conservation and recycling programs.

Policy 5.10.3-P2: Encourage new development to incorporate sustainable building design, site planning and construction, including encouraging solar opportunities.

Policy 5.10.3-P3: Reduce energy consumption through sustainable construction practices, materials and recycling.
4. Environmental Setting, Impacts, and Mitigation Measures

4.16 Energy Conservation

**Policy 5.10.3-P4:** Promote sustainable buildings and land planning for all new development, including programs that reduce energy and water consumption in new development.

**Policy 5.10.3-P5:** Encourage installation of solar energy collection through solar hot water heaters and photovoltaic arrays.

### 4.16.3 Baseline

The baseline for determination of potential impacts related to energy conservation at the WPCP consists of the energy (electrical and gas) usage associated with equipment and processes at the WPCP as it existed at the time of issuance of the notice of preparation for this PEIR (June 2015). Based on information provided by Carollo Engineers, the WPCP’s average power usage is 27,840 kWh/day (Carollo, 2014). The existing (2012) power use at the WPCP is approximately 10,160 megawatt-hours per year (MWh/year).

### 4.16.4 Impacts and Mitigation Measures

#### 4.16.4.1 Thresholds of Significance

In order to assure that energy implications are considered in project decisions, the California Environmental Quality Act requires that EIRs include a discussion of the potential energy effects of a project, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy (Public Resources Code Section 21100(b)(3)). The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include: (1) decreasing overall per capita energy consumption; (2) decreasing reliance on fossil fuels such as coal, natural gas and oil; and (3) increasing reliance on renewable energy sources.

Accordingly, the project would be considered to cause a significant impact related to energy conservation if it would:

- Use fuel or energy in a wasteful manner.
- Conflict with applicable energy efficiency policies or standards.

#### 4.16.4.2 Approach to Analysis

This impact analysis focuses on the potential for the Master Plan to result in a substantial increase in energy demand and/or wasteful use of energy during project construction and project operations, consistent with Public Resources Code 21100(b)(3) and Appendix F of the CEQA Guidelines. This analysis also discusses the extent to which construction activities would be conducted to minimize the use of fuels and ensure that fuels are not used in a wasteful manner. The analysis uses a qualitative approach to discuss energy demand from construction activities and focusses on conservation measures that would minimize the use of fuels and ensure that fuels are not used in a wasteful manner. Impacts on energy use and conservation associated with the Master Plan and the WPF are determined by evaluating the net changes in energy usage based on data provided by Carollo Engineers to assess whether the Master Plan’s energy needs
would be met with the onsite cogeneration facility and PG&E’s existing infrastructure facilities. The effectiveness of any energy conservation measures relative to the significance criterion identified above is also discussed. Energy efficiency and conservation features of the improvements proposed under the Master Plan and the WPF are evaluated for consistency with applicable energy efficiency policies and standards.

4.16.4.3 Impact Summary

Table 4.16-2 lists the project’s energy-related impacts and significance determinations.

<table>
<thead>
<tr>
<th></th>
<th>ENER-1: Use fuel or energy in a wasteful manner?</th>
<th>ENER-2: Conflict With Applicable Energy Policies or Standards?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Plan</td>
<td>LS</td>
<td>LS</td>
</tr>
<tr>
<td>Water Purification Facilities</td>
<td>LS</td>
<td>LS</td>
</tr>
</tbody>
</table>

LS = Less than Significant impact, no mitigation required.

4.16.4.4 Master Plan Impacts and Mitigation Measures

Impact ENER-1: Construction and operation of the proposed Master Plan would not result in use of fuel or energy in a wasteful manner, a less than significant impact.

Construction

Construction of the Master Plan would require the use of fuels (primarily gasoline, diesel, and motor oil) for the operation of equipment and vehicles to perform a variety of construction activities, including excavation, hauling, paving, and vehicle travel. Energy in the form of electricity may also be consumed by some pieces of construction equipment, such as welding machines, power tools, lighting, etc.; however, the amount of consumed electricity would be relatively minimal. In addition to direct construction-related energy consumption, indirect energy use would be required to make the materials and components used in construction. This includes energy used for extraction of raw materials, manufacturing, and transportation associated with manufacturing. Direct energy typically represents about one-quarter of total construction-related consumption while indirect energy use typically represents about three-quarters of total construction-related energy consumption (Hannon, 1978).

The precise amount of construction-related energy demand is uncertain. Construction of the various Master Plan improvements would be phased over a period of 20+ years. Although this usage would represent irreversible consumption of finite fossil fuel energy resources, the energy consumption associated with construction would not be permanent and would therefore not
result in long-term depletion of local or regional energy resources. Master Plan construction would not require excessive or wasteful use of energy as fuel use would be consistent with typical construction and manufacturing practices, and energy standards which promote strategic planning and building standards that reduce consumption of fossil fuels and enhance energy efficiency. Further, construction activities would not reduce or interrupt existing electrical or natural gas services due to insufficient supply, and would not include inherently wasteful or unnecessary use of energy. Therefore, this impact would be less than significant.

Additionally, implementation of Mitigation Measures AQ-2a and AQ-2b described in Section 4.5, Air Quality, which include the Bay Area Air Quality Management District’s required basic and additional mitigation measures, would further ensure that fuel energy consumed in the construction phase would not be wasted through unnecessary idling or through the operation of poorly maintained equipment. Excavated material would be used as backfill onsite where feasible, thereby minimizing fuel consumption associated with construction haul trucks and solid waste disposal. Because construction of the Master Plan would not be expected to result in wasteful or unnecessary use of energy, energy consumption that would be associated with construction activities would be less than significant.

**Operation**

Based on information provided by Carollo Engineers, by 2035, power demand at the WPCP due to the implementation of the Master Plan is expected to substantially increase relative to the existing baseline.

As noted above, annual energy demand at the WPCP was approximately 10,160 MWh in 2012. Implementation of the proposed Master Plan improvements with the new conventional activated sludge facilities replacing the existing secondary treatment system would increase power demand at the WPCP to approximately 28,340 MWh/year in 2035 (Carollo, 2015), a 170 percent increase over existing demand.

The PGF currently provides 94 percent of the WPCP’s operational electricity needs. Once the improvements proposed under the Master Plan become fully operational, the PGF would provide approximately a third of the Master Plan’s energy needs and the remainder would be provided to the WPCP as electricity purchased from PG&E. PG&E has determined that service to the WPCP would need to be upgraded to serve the Master Plan’s electricity demand of 3,100 kW (PG&E, 2015). Substantial changes to PG&E infrastructure to serve the Master Plan would require review by the California Public Utilities Commission, which would act as lead agency for purposes of CEQA.

Although gas from the nearby landfill is projected to decline, components of the Master Plan such as the Fats, Oils and Grease (FOG) / Food Waste Facility would enhance biogas production in the digesters. Digesting fats, oils, and grease, in addition to other liquid (emulsified) food wastes, can increase digester gas production. Additional gas produced by the digesters would be used to produce electricity for the WPCP. Improvements are also proposed to facilities associated with power generation, waste heat use, standby power, and power distribution at the WPCP to reduce
reliance on purchased natural gas. The existing power generation facility would be refurbished, including installation of two new 800-kW power generation engines, replacement of controls and heat recovery equipment, and installation of new piping. With these energy improvements proposed by the Master Plan, the increase in energy demand would not be considered wasteful.

Once construction is complete, the operations and maintenance work force at the WPCP is estimated to remain at a staff of 34. Traffic associated with material deliveries/off haul to and from the WPCP site based on future build-out conditions (2035) would generate approximately four additional trips per day. Energy demand associated with this increase in vehicle trips to the WPCP would be minimal and would not be considered wasteful. This impact would be less than significant.

**Mitigation:** None required.

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**Impact ENER-2:** Implementation of the proposed Master Plan would not conflict with applicable energy policies or standards, a less-than-significant impact.

**Construction**

As discussed under Impact ENER-1, construction of the Master Plan would result in both direct and indirect energy use. Direct energy represents fuel use associated with construction activities at the WPCP whereas indirect energy use would be the energy required to make the materials and components used in construction.

Construction fuel use would be consistent with typical construction and manufacturing practices, and energy standards such as the Energy Policy Acts of 1975 and 2005, and Title 24, which promote strategic planning and building standards that reduce consumption of fossil fuels, increase use of renewable resources, and enhance energy efficiency. Master Plan construction would not require excessive or wasteful use of energy and would therefore not conflict with the applicable energy policies. Additionally, implementation of Mitigation Measures AQ-2a and AQ-2b described in Section 4.5, Air Quality, which include the Bay Area Air Quality Management District’s required basic and additional mitigation measures, would further ensure efficient use of fuel energy consumed during construction consistent with the energy standards policies. This impact would therefore be less than significant.

**Operation**

As described above, the Master Plan proposes to refurbish the existing PGF, including installation of two new and energy efficient 800-kW power generation engines, replacement of controls and heat recovery equipment, and installation of new piping to the PGF. The PGF currently uses a blend of landfill gas from the nearby landfill (approximately 289,000 standard cubic feet per day), digester gas (approximately 161,000 standard cubic feet per day) and natural gas from PG&E (approximately 150,000 standard cubic feet per day) to produce power to meet 94 percent of the existing energy demand of the WPCP. In the future, gas from the nearby landfill is projected to
Environmental Setting, Impacts, and Mitigation Measures

4. Energy Conservation

4.16 Energy Conservation

Decline. However biogas production is projected to increase. The Master Plan also includes the implementation of the FOG / Food Waste Facility to enhance biogas production in the digesters. Digesting fats, oils, and grease, in addition to other liquid (emulsified) food wastes, can increase digester gas production. With these improvements, approximately 267,000 standard cubic feet of biogas would be generated. Additional gas produced by the digesters would be used to produce electricity for the WPCP. This would support the City’s goal to improve environmental sustainability by reducing reliance on non-renewable energy. Combustion of landfill gas and biogas at the PGF would meet approximately a third of the power needs of the Master Plan. The remaining two thirds would be provided by purchasing electricity from PG&E. Improvements are also proposed to facilities associated with standby power and power distribution at the WPCP.

Although the Master Plan would increase energy usage, these improvements would increase energy efficiency and conservation while reducing reliance on non-renewable natural gas. The administrative and support buildings would comply with the revised Title 24 standards that became effective on January 1, 2014 (CEC, 2012). These new standards are expected to be 30 percent more energy efficient for nonresidential construction, with better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption. Implementation of the Master Plan would be subject to the City’s Green Building Ordinance which requires construction and operation of buildings to employ materials and methods that promote natural resource conservation, energy efficiency, and good indoor air quality. Therefore, implementation of the Master Plan would be consistent with all applicable energy policies and standards and this impact would be less than significant.

Mitigation: None required.

4.16.4.5 WPF Impacts and Mitigation Measures

Impact WPF-ENER-1: Construction and operation of the WPF would not result in use of fuel or energy in a wasteful manner, a less than significant impact.

Construction

Similar to the construction impacts for the Master Plan, described under Impact ENER-1, construction of the WPF would require the use of fuels and minimal amounts of energy.

As with the Master Plan, the precise amount of construction-related energy required for the implementation of the WPF is uncertain. The various WPF components would also be phased over a period of 20 years. However, the energy consumption associated with construction of the WPF would be similar to those under the Master Plan as described in Impact ENER-1 and would likewise be considered less than significant. In addition, implementation of Mitigation Measures WPF-AQ-2a and 2b (detailed in Section 4.5, Air Quality) would reduce construction energy use to the extent possible using best management practices.
4. Environmental Setting, Impacts, and Mitigation Measures

4.16 Energy Conservation

Operation

The WPF includes more energy intensive components than the Master Plan. With the implementation of the WPF, energy use at WPCP is projected to increase more than six fold to approximately 61,320 MWh/year in 2035 (Carollo, 2015), corresponding to an electricity demand of 7,000 kW. This includes the energy associated with WPF components at the WPCP as well as the WPF groundwater replenishment facilities located off the WPCP.

The power produced by the PGF at the WPCP would meet 14 percent of the WPF’s power needs. Therefore, the majority of the WPF’s increased power demand (approximately 52,341 MWh/year) would be met by purchasing electricity from PG&E. PG&E has determined that in order to serve the WPF’s electricity demand, service will need to be upgraded and a new distribution feeder installed from Lockheed #2 substation (PG&E, 2015). If the WPF is implemented, the City or District would proceed with design to better characterize the WPF including energy requirements. At that time, the City or District would coordinate with PG&E regarding the WPF’s specific demand characteristics. PG&E would then determine, in conjunction with other projects served by the Lockheed Substation and other infrastructure serving the WPCP, the improvements needed and initiate design. The California Public Utilities Commission would likely serve as the lead agency for environmental review pursuant to CEQA.

As with the Master Plan, implementation of the FOG program would increase the generation of digester gases, which would be used in the PGF to produce electricity for the WPCP and would offset part of the increase in power demand. Other improvements proposed to facilities associated with power generation, waste heat use, standby power, and power distribution at the WPCP would also contribute to additional energy conservation. Though the implementation of the WPF would result in a considerable increase in the WPCP’s energy demand this use would not be considered wasteful. In addition to supporting the City’s goal to improve the overall efficiency of the WPCP, enabling the City to maintain the operational reliability of the WPCP and provide wastewater treatment to its customers, implementation of the WPF would also help implement City goals to maximize water recycling opportunities by enhancing supplies and producing a higher quality recycled water. Therefore the increase in energy demand associated with the WPF would be considered necessary and not wasteful. This would therefore be a less than significant impact.

Once construction is complete, the operations and maintenance work force at the WPCP is estimated to increase by 3-4 workers over the existing staff of 34, increasing by up to 12 the number of vehicle one-way trips to or from the site per day. As with the Master Plan, the WPF would require infrequent trips for routine and emergency maintenance. Traffic associated with material deliveries/off haul to and from the WPCP site based on future build-out conditions (2035) would be generate approximately four trips per day. Energy demand associated with these increases in vehicle trips to the WPCP would be minimal and necessary. This impact would be less than significant.

Mitigation: None required.
Impact WPF-ENER-2: Implementation of the WPF would not conflict with applicable energy policies or standards, a less-than-significant impact.

**Construction**

As discussed under Impact WPF-ENER-1, construction of the WPF would result in both direct and indirect energy use. Construction of the WPF components would lead to increased energy use, primarily in the form of non-renewable fuels such as gasoline and diesel, and electricity to a lesser extent. Construction activities associated with the WPF would take place onsite at the WPCP as well as offsite along pipeline alignments that convey the treated water to recharge basins and injection wells south of the WPCP.

Similar to the Master Plan, construction fuel use would be consistent with typical construction and manufacturing practices, and energy standards (further discussed under Impact ENER-2). Additionally, implementation of the measures and excavation practices described under Impact ENER-2 would further reduce fuel consumption. Because construction of the WPF would not be expected to have a material effect on energy resources, or result in wasteful or unnecessary use of energy, energy consumption that would be associated with construction activities would be consistent with applicable energy goals and policies; this impact would be less than significant.

**Operation**

Changes to the PGF, the support facilities and the WPCP energy distribution system would be similar to those proposed under the Master Plan. The existing PGF would be refurbished with the installation of two new and energy efficient 800-kW power generation engines, replacement of controls and heat recovery equipment, and installation of new piping. Improvements are also proposed to facilities associated with standby power and power distribution at the WPCP. Although the WPF would increase energy usage, these improvements would improve the overall efficiency of the WPCP in the same ways as identified in Impact ENER-2, above. Therefore, although the implementation of the WPF would result in an increased energy demand, it would also incorporate features to improve energy efficiency and conservation and would be consistent with applicable energy policies and standards. Implementation of the WPF would support the General Plan’s goal to improve environmental sustainability through the use of renewable energy resources. The impact of the WPF on compliance with energy policies or standards would be less than significant.

**Mitigation:** None required.
4.16.5 References


Carollo Engineers, 2015. Response to Request for Information regarding projected energy usage at Sunnyvale WPCP.


City of Cupertino, 2014. General Plan – Community Vision 2040, Adopted on December 4, 2014

City of San José, 2011. Envision San José 2040 General Plan, November 1, 2011.

City of Santa Clara, 2010-2035 General Plan, Adopted on November 16, 2010


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CHAPTER 5
Growth Inducement Potential and Secondary Effects of Growth

<table>
<thead>
<tr>
<th>Sections</th>
<th>Tables</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Introduction</td>
<td>5-1 Demographic Assumptions Used to Project Future Flows and Loads</td>
</tr>
<tr>
<td>5.2 Growth Inducement Potential</td>
<td>5-2 Population Growth Trends within Santa Clara County</td>
</tr>
<tr>
<td>5.3 Growth Inducement Potential Conclusions</td>
<td>5-3 ABAG Population, Housing, and Employment Projections: Santa Clara County</td>
</tr>
<tr>
<td>5.4 Impacts and Mitigation Measures: Secondary Effects of Growth</td>
<td>5-4 Growth Assumptions Used for Flows and Loads Projections Compared with 2011 Consolidated General Plan</td>
</tr>
<tr>
<td>5.5 References</td>
<td>5-5 Growth Assumptions Used for Flows and Loads Projections Compared with 2015 Draft LUTE</td>
</tr>
<tr>
<td></td>
<td>5-6 District UWMP Projected Average-Year Supplies</td>
</tr>
<tr>
<td></td>
<td>5-7 District UWMP Projected Population and Average-Year Water Supply and Demand Summary</td>
</tr>
<tr>
<td></td>
<td>5-8 District Water Master Plan Projected Average-Year Supplies</td>
</tr>
<tr>
<td></td>
<td>5-9 Agencies with the Authority to Implement or Require Implementation of Measures to Avoid or Mitigate Growth-Related Impacts</td>
</tr>
</tbody>
</table>

5.1 Introduction

This chapter analyzes the growth inducement potential and associated secondary effects of growth impacts of the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan (Master Plan), as required by the California Environmental Quality Act (CEQA) and CEQA Guidelines. CEQA requirements and the approach to analyzing the project’s growth inducing impacts are discussed below.

5.1.1 CEQA Requirements

CEQA Guidelines\(^1\) require that an environmental impact report (EIR) evaluate the growth inducing impacts of a proposed project. The EIR should:

- Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this area are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax

\(^1\) CEQA Guidelines, California Code of Regulations Title 14, Chapter 3.).
existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can have direct and/or indirect growth inducement potential. Direct growth would result if a project involved construction of new housing or substantial commercial development. A project would have an indirect growth inducement effect if it removed an obstacle to additional growth and development, such as removing a constraint on a required public service.

5.1.2 Approach to Analysis

Based on the CEQA requirement above, assessing the growth inducement potential of the Master Plan involves answering the question: Would construction and/or operation of the proposed Master Plan improvements directly or indirectly support economic or population growth or residential construction?

The Master Plan would rehabilitate and replace aging infrastructure, provide operational reliability, and include treatment systems designed to meet the requirements of changing regulations. In addition, the Master Plan would provide increased capacity for several treatment processes in order to accommodate projected future increases in flows and loads. Master Plan components that would address future capacity deficiencies consist of (1) Stage 2 of the conventional activated sludge treatment process, (2) Phase 2 of the solids thickening and dewatering facility (which would be needed to support conversion from split-flow to full [Stage 2] conventional activated sludge), and (3) construction of a fifth digester. By removing insufficient wastewater treatment capacity as one potential obstacle to growth, the Master Plan could have an indirect growth inducing effect according to the CEQA Guidelines cited above. The Master Plan would not directly induce growth as it does not involve the development of new housing to attract additional population or the development of substantial new employment opportunities.

The Water Purification Facilities (WPF) would be designed to produce 10 million gallons per day (mgd) of purified water, but could be expanded to 15 mgd should recycled water demands increase in the future. The purified water would be delivered to the Santa Clara Valley Water District (District), which would use it to recharge the groundwater basin to augment potable water supplies in Santa Clara County. The WPF would, like the Master Plan, provide increased wastewater treatment capacity to accommodate projected future increases in flows and loads. By contributing a new source of potable water supply as well as increased wastewater treatment capacity, the WPF would remove (in part) insufficient water supply and insufficient wastewater treatment capacity as potential obstacles to growth, and could for these reasons have an indirect growth-inducing effect according to CEQA. As noted above for the Master Plan, the WPF would not directly induce growth as it does not involve the development of new housing to attract additional population or the development of substantial new employment opportunities.

As described in Chapter 3, Project Description, Section 3.5.5, the WPF would be designed to produce 10 mgd but could be expanded to produce 15 mgd should recycled water demands increase in the future.

The 10 to potentially 15 mgd of potable supply that the WPF would provide would contribute, with other supply sources, to meeting projected increases in demand within the county.
A variety of factors influence new development or population growth in the area that would be served by the Master Plan or WPF, including economic conditions of the region, adopted growth management policies of the affected communities, and the availability of adequate infrastructure (e.g., water service, sewer service and associated wastewater treatment capacity, public schools and roadways), with economic factors generally the lead driver. Adequate wastewater treatment in conjunction with sewer service and adequate water supply are key public services needed to support development in urban areas, and a deficiency in either wastewater treatment capacity or water supply could constrain future development.

In accordance with the CEQA Guidelines cited above, growth per se is not assumed to be necessarily beneficial, detrimental, or of little significance to the environment; it is the secondary, or indirect, effects of growth that can cause adverse changes to the physical environment. Such effects can include increased traffic and noise, degradation of air and water quality, conversion of open space and agricultural land to urban uses, and increased demand on community services and public service infrastructure, among other potential impacts. Local land use plans (e.g., general plans and specific plans) of the jurisdictions that would be served by the Master Plan or WPF establish land use development patterns and growth policies that are intended to allow for the orderly expansion of urban development supported by adequate public services, including sewer service and wastewater treatment, water service, roadway infrastructure and solid waste service. Local jurisdictions conduct CEQA environmental review on their general and specific plans to assess the secondary effects of their planned growth. A project that would induce growth that is inconsistent with local land use plans and policies could indirectly cause adverse environmental impacts, as well as impacts on public services, that the local land use jurisdictions have not previously addressed in the CEQA review of their land use plans and development proposals. Consequently, the levels of growth accommodated by implementation of the Master Plan or WPF are evaluated for consistency with future planned growth outlined in applicable plans and policies. However, even planned growth can result in significant environmental effects, and the Master Plan or WPF could indirectly contribute to such impacts by removing obstacles to planned development within the WPCP or the District service areas.

To assess the Master Plan’s and WPF’s potential to induce growth and contribute to adverse environmental effects associated with growth, this chapter:

- Explores the relationship between growth and WPCP operations
- Describes the growth assumptions underlying flows and loads projections developed as part of Master Plan design and planning
- Compares these assumptions with population and non-residential development forecasts contained in the City’s adopted General Plan and draft General Plan Land Use and Transportation Element
- Describes potable reuse water supply that would be produced under the WPF and compares these supplies with the District’s forecasts of growth and water demand and supply
- Discloses secondary effects associated with forecasted growth that could adversely affect the physical environment
5.2 Growth Inducement Potential

5.2.1 WPCP Master Plan Treatment Capacity and Flow Projections

5.2.1.1 WPCP Treatment Capacity

The existing WPCP has substantial capacity to accommodate influent flows and loads and, as noted, growth is not considered a primary driver for the Master Plan. The Stage 1 split flow conventional activated sludge facilities and Stage 1 MBR facilities would replace the capacity provided by the existing WPCP to accommodate projected flows and loads. During the Master Planning Period, however, the following three Master Plan components would be needed to increase capacity in order to accommodate projected increases in flows and loads:

- Stage 2 conventional activated sludge (i.e., conversion to full conventional activated sludge) (scheduled for implementation between 2030 and 2035)
- Phase 2 of the solids thickening and dewatering facility (needed to support conversion from split flow to full conventional activated sludge and also scheduled for implementation between 2030 and 2035)
- Digester No. 5 (scheduled for implementation between 2025 and 2030)

Under the WPF, the MBR facilities would be constructed in stages. Stage 2 MBR facilities (e.g., additional aeration blowers and membrane racks) would be implemented when needed to respond to regulatory changes and/or to accommodate increased flows and loads generated within the WPCP service area (scheduled for implementation between 2030 and 2035). Absent these improvements, the WPCP’s capacity could pose an obstacle to growth within the timeframe covered by the Master Plan; implementation of these improvements would remove that obstacle. Prior to implementation of these capacity improvements, the City will initiate a new investigation of capacity requirements using updated information, including updated population and employment forecasts and the City’s adopted General Plan.

5.2.1.2 Service Area Flows and Loads Projections

**Phased Approach to Master Plan Implementation**

As part of developing the proposed Master Plan, the City’s consulting engineers developed projections of future flows and loads for use in planning and design of Master Plan treatment alternatives (Carollo Engineers and HDR, 2013, p.1). The projections of flows and loads were developed for the entire Master Planning Period (to 2035) in part for the purpose of planning site layout, to ensure that the WPCP’s relatively small site could accommodate all Master Plan facilities.

4 Two of the three components needed to provide increased capacity, the Phase 2 conventional activated sludge system and Phase 2 solids thickening and dewatering facilities, are also needed to meet anticipated regulatory requirements. Therefore, implementation of the second phase of these two Master Plan components may be triggered by regulatory requirements, rather than capacity needs, if new regulations precede the need for additional capacity. Likewise, implementation of Stage 2 of the MBR facilities under the WPF could be triggered by regulatory requirements rather than capacity needs.
and processes or those of the WPF. Due to uncertainties regarding the long term projections and future regulations over this period, the City adopted the phased split-flow approach (described in Chapter 3, Project Description) to implement the new conventional activated sludge secondary treatment facilities. Prior to full implementation of the conventional activated sludge and solids thickening and dewatering facilities and processes, or construction of a fifth digester, the flows and loads projections will be updated to ensure that the Stage 2 or Phase 2 facilities are appropriately sized to accommodate projected capacity needs consistent with adopted plans and policies.

Site requirements for the WPF do not allow for a phased, split-flow approach comparable to that proposed for the conventional activated sludge system, if the WPF is selected for implementation. However, similar to the phased approach described for the conventional activated sludge treatment process, the membrane bioreactor (MBR) facilities of the WPF would be implemented in stages since the ultimate MBR capacity that is projected to be needed would not be needed at the outset. The Stage 1 MBR facilities would fully replace the WPCP’s existing secondary treatment system, and the Stage 2 facilities would be added based on future regulatory requirements or capacity needs. Implementation of the Stage 2 MBR facilities is expected to occur between 2030 and 2035. As described for the conventional activated sludge system, flows and loads projections would be updated prior to implementation of Stage 2 MBR facilities.

Digest No. 5, in conjunction with either the conventional activated sludge or WPF treatment systems, would be constructed when it is needed to accommodate increased loads, and is currently expected to be constructed between 2025 and 2030. Phasing the implementation of facilities with long planning horizons such as the WPCP – adding capacity when it is needed – is common practice to avoid overbuilding.

**Methods and Assumptions Used To Project Future Flows and Loads**

Duty factors reflecting wastewater flow generation rates had been developed for different land use zoning classifications throughout Sunnyvale for the City’s 2013 Wastewater Collection System Master Plan. To project future average dry weather flow for the Master Plan, the average of the residential duty factors (148 gallons per day per residential unit) and the average of the non-residential duty factors (140 gallons per day per 1,000 square feet of non-residential floor area) were applied to the number of housing units and total industrial-office-commercial floor area, respectively, that were projected to be developed over the Master Planning Period. Using this methodology, average dry weather flow was estimated to be 14.5 mgd in 2015 and 19.5 mgd in 2035.

Load projections were developed using current loads and projected community growth. Total suspended solids (TSS) data were analyzed for the years 2000 through 2012; ultimately, data for 2011 and 2012 were used to estimate current loads. Average per capita TSS loads were determined for 2011 and 2012 by dividing average dry weather loads by population estimates provided by the City for each year; historical and current data were analyzed to determine load peaking factors for average day annual loads and maximum month, maximum week and peak day loads. To project future loads, the average per capita loads and load peaking factors were applied to projected population for the Master Planning Period. The average dry weather loads were projected to be 27,000 pounds per day in 2015 and 34,000 pounds per day in 2035. (Estimates for intervening years at five-year intervals were also calculated.) Peaking factors were applied to these dry weather flow
estimates to project estimates for the other load classifications referenced above (Carollo Engineers and HDR, 2013, pp. 4-8).

Projections of the number of housing units, non-residential floor area, and population used for the flows and loads projections were provided by the City and based on the City’s draft General Plan Land Use and Transportation Element (LUTE). The update of the LUTE is currently undergoing CEQA review and is expected to be published in 2016 (City of Sunnyvale, 2015a). Table 5-1 indicates growth assumptions provided by the City for the flows and loads projections. (Planning agency projections are discussed further in Section 5.2.3.)

**TABLE 5-1**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Existing Conditions</th>
<th>Buildout (2035)</th>
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<tbody>
<tr>
<td>Population</td>
<td>141,000</td>
<td>174,600</td>
</tr>
<tr>
<td>Housing Units</td>
<td>55,400</td>
<td>72,160</td>
</tr>
<tr>
<td>Industrial/Office/ Commercial Square Feet</td>
<td>46,700,000</td>
<td>63,100,000</td>
</tr>
<tr>
<td>Jobs</td>
<td>77,890</td>
<td>132,000</td>
</tr>
</tbody>
</table>

SOURCE: Carollo Engineers and HDR, 2013, p. 2.

### 5.2.1.3 NPDES Permit

Another measure of WPCP’s existing capacity to accommodate projected increased flows under the Master Plan is the amount of effluent it is permitted to discharge (to South San Francisco Bay via a tributary channel). The WPCP’s existing NPDES permit (NPDES No. CA0037621) limits the plant’s discharge of average dry weather effluent flow to a maximum of 29.5 mgd. This discharge volume is substantially greater than both the current average dry weather effluent flow (14.5 mgd) and future average dry weather flow projected to occur by 2035 under the Master Plan (19.5 mgd). Therefore, the WPCP’s permitted NPDES effluent discharge limit would not need to be increased and would not constitute an obstacle to projected future growth under the Master Plan.

### 5.2.2 WPF

#### 5.2.2.1 WPF Treatment Capacity

The WPF would be designed to accommodate the same projected flows and loads described above in Section 5.2.1. As noted in that discussion, the Stage 1 MBR facilities would fully replace existing secondary treatment facilities. Additional MBR facilities would be added in Stage 2 (scheduled for implementation between 2030 and 2035) when needed to address regulatory requirements or accommodate increases in flows and loads. Digester No. 5 is currently expected to be added between 2025 and 2030.

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5 The NPDES permitted effluent flow level was established at a time when the City had more industries (primarily canneries) that generated high volumes of wastewater.
5.2.2.2 WPF Water Supply

The WPF would provide 10 mgd (or about 11,200 acre-feet per year [AFY]) of potable water supply to the District, with the potential to increase to 15 mgd (about 16,800 AFY). The District would use the water to recharge the groundwater basin, thereby increasing groundwater supplies for the beneficial uses of the groundwater basin. The contribution of the WPF to District supplies is discussed in more detail below in Section 5.2.3.3, Local Agency Projections.

5.2.3 Service Area Growth Trends and Projections

5.2.3.1 Population Growth 1990 - 2010

Table 5-2 shows population growth within Santa Clara County from 1990 to 2010 based on U.S. Census data from the California Department of Finance. Sunnyvale’s population increased from approximately 117,300 in 1990 to approximately 140,100 in 2010, an increase of about 19 percent. Total population within the County also increased by 19 percent over this twenty-year-period, from approximately 1.49 million in 1990 to approximately 1.78 million in 2010, an increase of nearly 285,000. The largest net growth occurred in the City of San José, which added approximately 164,000 people between 1990 and 2010. Sunnyvale had the third largest net increase in population, adding almost 23,000 people over this period. The largest percent growth occurred in the southern part of the County, in the Cities of Morgan Hill and Gilroy, which grew by approximately 58 percent and 55 percent, respectively.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Campbell</td>
<td>36,088</td>
<td>39,349</td>
<td>3,261</td>
<td>9%</td>
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</tr>
<tr>
<td>Cupertino</td>
<td>39,967</td>
<td>58,302</td>
<td>18,335</td>
<td>46%</td>
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</tr>
<tr>
<td>Gilroy</td>
<td>31,487</td>
<td>48,821</td>
<td>17,334</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>Los Altos</td>
<td>26,599</td>
<td>28,976</td>
<td>2,377</td>
<td>9%</td>
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</tr>
<tr>
<td>Los Altos Hills</td>
<td>7,514</td>
<td>7,922</td>
<td>408</td>
<td>5%</td>
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</tr>
<tr>
<td>Los Gatos</td>
<td>27,357</td>
<td>29,413</td>
<td>2,056</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Milpitas</td>
<td>50,690</td>
<td>66,790</td>
<td>16,100</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>Monte Sereno</td>
<td>3,267</td>
<td>3,341</td>
<td>74</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Morgan Hill</td>
<td>23,928</td>
<td>37,882</td>
<td>13,954</td>
<td>58%</td>
<td></td>
</tr>
<tr>
<td>Mountain View</td>
<td>67,365</td>
<td>74,066</td>
<td>6,701</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Palo Alto</td>
<td>55,900</td>
<td>64,403</td>
<td>8,503</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>San José</td>
<td>782,224</td>
<td>945,942</td>
<td>163,718</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Santa Clara</td>
<td>93,613</td>
<td>116,468</td>
<td>22,855</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Saratoga</td>
<td>28,061</td>
<td>29,926</td>
<td>1,865</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Sunnyvale</td>
<td>117,324</td>
<td>140,081</td>
<td>22,757</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>Unincorporated</td>
<td>106,173</td>
<td>89,960</td>
<td>-16,213</td>
<td>-15%</td>
<td></td>
</tr>
<tr>
<td><strong>Total Santa Clara County</strong></td>
<td><strong>1,497,577</strong></td>
<td><strong>1,781,642</strong></td>
<td><strong>284,065</strong></td>
<td><strong>19%</strong></td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: California Department Of Finance 2007, California Department Of Finance 2012
5.2.3.2 Regional Planning Agency Projections

ABAG is the official regional planning agency of the San Francisco Bay Area; its members include the nine Bay Area counties and the 101 cities and towns within the Bay Area, and its mission is to strengthen cooperation and coordination among local governments. Since its inception in 1961, ABAG has examined regional issues such as housing, transportation, economic development, and the environment. ABAG’s Projections series provides long-term population, housing, and economic forecasts through a series of computer models. Transportation and air quality agencies, water agencies, local governments, and others rely on ABAG’s model results for planning. Table 5-3 shows the population, housing, and job forecasts for Santa Clara County in ABAG’s current projections series, Projections 2013, for the next twenty years, from 2015 through 2035. ABAG projects that Sunnyvale’s population will increase by about 36,000 between 2015 and 2035, a 24 percent increase. Population within Santa Clara County is expected to increase from approximately 1.88 million in 2015 to 2.3 million in 2035, an increase of approximately 426,000 (23 percent). As the table shows, the number of households is expected to increase at a rate similar to population, with a 23 percent increase in households projected for Sunnyvale between 2015 and 2035 and a 22 percent increase for the County as a whole. Growth in jobs over this period is expected to be slightly slower than population and households, with a 19 percent increase in jobs projected for Sunnyvale and an 18 percent increase in jobs projected for the County.

### TABLE 5-3

ABAG POPULATION, HOUSING, AND EMPLOYMENT PROJECTIONS: SANTA CLARA COUNTY

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Net</td>
</tr>
<tr>
<td>Campbell</td>
<td>40,600</td>
<td>46,400</td>
<td>5,800</td>
</tr>
<tr>
<td>Cupertino</td>
<td>60,600</td>
<td>69,200</td>
<td>8,600</td>
</tr>
<tr>
<td>Gilroy</td>
<td>57,500</td>
<td>66,000</td>
<td>8,500</td>
</tr>
<tr>
<td>Los Altos</td>
<td>32,300</td>
<td>35,100</td>
<td>2,800</td>
</tr>
<tr>
<td>Los Altos Hills</td>
<td>8,800</td>
<td>9,300</td>
<td>500</td>
</tr>
<tr>
<td>Los Gatos</td>
<td>32,900</td>
<td>35,600</td>
<td>2,700</td>
</tr>
<tr>
<td>Milpitas</td>
<td>73,200</td>
<td>101,400</td>
<td>28,200</td>
</tr>
<tr>
<td>Monte Sereno</td>
<td>3,900</td>
<td>4,100</td>
<td>200</td>
</tr>
<tr>
<td>Morgan Hill</td>
<td>46,000</td>
<td>54,700</td>
<td>8,700</td>
</tr>
<tr>
<td>Mountain View</td>
<td>79,100</td>
<td>96,300</td>
<td>17,200</td>
</tr>
<tr>
<td>Palo Alto</td>
<td>81,700</td>
<td>96,600</td>
<td>14,900</td>
</tr>
<tr>
<td>San José</td>
<td>1,045,300</td>
<td>1,307,800</td>
<td>262,500</td>
</tr>
<tr>
<td>Santa Clara</td>
<td>122,500</td>
<td>149,000</td>
<td>26,500</td>
</tr>
<tr>
<td>Saratoga</td>
<td>30,900</td>
<td>33,100</td>
<td>2,200</td>
</tr>
<tr>
<td>Sunnyvale</td>
<td>148,400</td>
<td>184,300</td>
<td>35,900</td>
</tr>
<tr>
<td>Remainderb</td>
<td>14,000</td>
<td>14,600</td>
<td>600</td>
</tr>
<tr>
<td>Total Santa Clara County</td>
<td>1,877,700</td>
<td>2,303,500</td>
<td>425,800</td>
</tr>
</tbody>
</table>
### TABLE 5-3 (Continued)

**ABAG POPULATION, HOUSING, AND EMPLOYMENT PROJECTIONS: SANTA CLARA COUNTY**

<table>
<thead>
<tr>
<th>City</th>
<th>Households 2015</th>
<th>Households 2035</th>
<th>Net Change</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campbell</td>
<td>16,700</td>
<td>18,880</td>
<td>2,180</td>
<td>13%</td>
</tr>
<tr>
<td>Cupertino</td>
<td>20,950</td>
<td>23,520</td>
<td>2,570</td>
<td>12%</td>
</tr>
<tr>
<td>Gilroy</td>
<td>16,680</td>
<td>18,610</td>
<td>1,930</td>
<td>12%</td>
</tr>
<tr>
<td>Los Altos</td>
<td>11,920</td>
<td>12,680</td>
<td>760</td>
<td>6%</td>
</tr>
<tr>
<td>Los Altos Hills</td>
<td>3,110</td>
<td>3,270</td>
<td>160</td>
<td>5%</td>
</tr>
<tr>
<td>Los Gatos</td>
<td>13,540</td>
<td>14,300</td>
<td>760</td>
<td>6%</td>
</tr>
<tr>
<td>Milpitas</td>
<td>21,280</td>
<td>29,620</td>
<td>8,340</td>
<td>39%</td>
</tr>
<tr>
<td>Monte Sereno</td>
<td>1,410</td>
<td>1,490</td>
<td>80</td>
<td>6%</td>
</tr>
<tr>
<td>Morgan Hill</td>
<td>14,890</td>
<td>17,470</td>
<td>2,580</td>
<td>17%</td>
</tr>
<tr>
<td>Mountain View</td>
<td>33,900</td>
<td>40,470</td>
<td>6,570</td>
<td>19%</td>
</tr>
<tr>
<td>Palo Alto</td>
<td>31,810</td>
<td>37,260</td>
<td>5,450</td>
<td>17%</td>
</tr>
<tr>
<td>San José</td>
<td>335,190</td>
<td>423,730</td>
<td>88,540</td>
<td>26%</td>
</tr>
<tr>
<td>Santa Clara</td>
<td>45,350</td>
<td>54,830</td>
<td>9,480</td>
<td>21%</td>
</tr>
<tr>
<td>Saratoga</td>
<td>11,070</td>
<td>11,600</td>
<td>530</td>
<td>5%</td>
</tr>
<tr>
<td>Sunnyvale</td>
<td>56,560</td>
<td>69,490</td>
<td>12,930</td>
<td>23%</td>
</tr>
<tr>
<td>Remainderb</td>
<td>4,800</td>
<td>4,900</td>
<td>100</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total Santa Clara County</strong></td>
<td><strong>639,160</strong></td>
<td><strong>782,120</strong></td>
<td><strong>142,960</strong></td>
<td><strong>22%</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City</th>
<th>Jobs 2015</th>
<th>Jobs 2035</th>
<th>Net Change</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campbell</td>
<td>29,410</td>
<td>34,110</td>
<td>4,700</td>
<td>16%</td>
</tr>
<tr>
<td>Cupertino</td>
<td>28,080</td>
<td>32,300</td>
<td>4,220</td>
<td>15%</td>
</tr>
<tr>
<td>Gilroy</td>
<td>22,000</td>
<td>24,580</td>
<td>2,580</td>
<td>12%</td>
</tr>
<tr>
<td>Los Altos</td>
<td>16,150</td>
<td>18,300</td>
<td>2,150</td>
<td>13%</td>
</tr>
<tr>
<td>Los Altos Hills</td>
<td>2,390</td>
<td>2,700</td>
<td>310</td>
<td>13%</td>
</tr>
<tr>
<td>Los Gatos</td>
<td>25,360</td>
<td>28,670</td>
<td>3,310</td>
<td>13%</td>
</tr>
<tr>
<td>Milpitas</td>
<td>48,820</td>
<td>56,260</td>
<td>7,440</td>
<td>15%</td>
</tr>
<tr>
<td>Monte Sereno</td>
<td>650</td>
<td>760</td>
<td>110</td>
<td>17%</td>
</tr>
<tr>
<td>Morgan Hill</td>
<td>20,210</td>
<td>22,900</td>
<td>2,690</td>
<td>13%</td>
</tr>
<tr>
<td>Mountain View</td>
<td>56,380</td>
<td>65,890</td>
<td>9,510</td>
<td>17%</td>
</tr>
<tr>
<td>Palo Alto</td>
<td>102,080</td>
<td>120,970</td>
<td>18,890</td>
<td>19%</td>
</tr>
<tr>
<td>San José</td>
<td>434,500</td>
<td>525,080</td>
<td>90,580</td>
<td>21%</td>
</tr>
<tr>
<td>Santa Clara</td>
<td>121,950</td>
<td>141,700</td>
<td>19,750</td>
<td>16%</td>
</tr>
<tr>
<td>Saratoga</td>
<td>10,520</td>
<td>11,560</td>
<td>1,040</td>
<td>10%</td>
</tr>
<tr>
<td>Sunnyvale</td>
<td>81,880</td>
<td>97,630</td>
<td>15,750</td>
<td>19%</td>
</tr>
<tr>
<td>Remainderb</td>
<td>3,400</td>
<td>3,600</td>
<td>200</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total Santa Clara County</strong></td>
<td><strong>1,003,780</strong></td>
<td><strong>1,187,010</strong></td>
<td><strong>183,230</strong></td>
<td><strong>18%</strong></td>
</tr>
</tbody>
</table>

*a Projections are for the city and its respective sphere of influence, which may include unincorporated land outside its jurisdictional boundary.

b “Remainder” refers to unincorporated County areas not included in the cities’ spheres of influence.

SOURCE: Association of Bay Area Governments, 2013
5.2.3.3 Local Agency Projections

City of Sunnyvale

Sunnyvale is the second largest city in Santa Clara County and has an urban service area of about 24 square miles. In 2011 Sunnyvale consolidated its General Plan. The consolidated General Plan was assembled from 22 separate General Plan elements and sub-elements that had been adopted at different times; it provides growth projections for 2025 and buildout (City of Sunnyvale, 2011a pp. 1-5, 2-30, 2-31, 2-44). The City is in the process of updating the General Plan Land Use and Transportation Element (LUTE), a process that was foreseen and noted in the 2011 consolidated General Plan. The LUTE update commenced in 2012 in conjunction with preparation of the City’s Climate Action Plan. In anticipation of the updated LUTE, in 2013 the City provided its consulting engineers with projections from the draft LUTE to use in projecting future flows and loads for the Master Plan (shown above in Table 5-1). Subsequently, the Climate Action Plan was separated from the LUTE update and adopted by the City Council independently from the LUTE update. In May 2015 the City reissued a notice of preparation (NOP) of an EIR for the LUTE update and the draft LUTE update is currently undergoing CEQA review.

Sunnyvale’s 2010 Urban Water Management Plan (UWMP) (City of Sunnyvale, 2011b) provides water supply projections to 2035. The UWMP indicates that recycled water use was expected to increase from 1,400 AFY to 1,775 AFY in an average-weather year, and that the City’s long term goal is to reuse all of the wastewater generated at the WPCP (estimated in the UWMP to be 15 mgd). The UWMP anticipated that achieving this long term goal would involve export of recycled water outside the city limits (City of Sunnyvale, 2011b, page 4-7).

The City’s 2013 Feasibility Study for Recycled Water Expansion Report (HydroScience, 2013) anticipates that recycled water use would increase by 2,061 AFY to a near-term demand of 3,123 (about 2.8 mgd), and identifies a targeted annual average day treatment demand of 3.6 mgd. The estimated 2,061 AFY of additional near-term demand is based on identified target customers along 16 infrastructure alignments as well as infill connections to the existing recycled water system (HydroScience, 2013, pp. ES-6 ES-8, ES-9, 10-4). Like the UWMP, the feasibility study notes that the long-term goal of the City is to reuse 100 percent of the wastewater generated from the WPCP (HydroScience, 2013, p. ES-2).

Similarly, the 2014 South Bay Water Recycling Strategic and Master Planning Report (SCVWD and City of San José, 2014) states that Sunnyvale expects recycled water demand to increase by 2,061 AFY, from a baseline demand of 1,062 AFY to 3,123 AFY, and that the City’s longer-term goal was to reuse all of the wastewater generated from the WPCP. The South Bay water recycling plan notes that discussions were underway regarding potential interties between the recycled water producers to both supplement supplies and improve reliability (SCVWD and City of

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6 Every urban water supplier is required, pursuant to the Urban Water Management Planning Act (California Water Code Section 10610 et seq.), to prepare a UWMP for the purpose of “actively pursuing the efficient use of available supplies.” The Act requires urban water suppliers, as part of their long-range planning activities, to make every effort to ensure the appropriate level of reliability in their water service sufficient to meet the needs of their water customers during normal (or average), dry, and multiple dry water years.
San José, 2014, p ES-28). The South Bay water recycling plan states Sunnyvale is also pursuing indirect potable reuse projects within and outside the city limits and that if the City pursued potable reuse, the expansion of its non-potable reuse system would be limited unless interties were secured to another recycled water supply (SCVWD and City of San José, 2014, p 9-14).

**Comparison of Master Plan Growth Assumptions with Adopted General Plan**

Because the growth forecasts used for the flows and loads projections had not been adopted, this analysis compares the growth assumptions used for the flows and loads projections with those in the currently adopted 2011 consolidated General Plan. In addition, the draft LUTE that is currently undergoing CEQA review (referred to herein as the 2015 draft LUTE) includes growth assumptions that have been revised slightly compared to the assumptions used for the flows and loads projections. Therefore this analysis also compares the growth assumptions used for the flows and loads projections with those in the 2015 draft LUTE. Table 5-4 presents a comparison of growth assumptions used for Master Plan flows and loads projections with buildout of the 2011 consolidated General Plan. Table 5-5 compares the growth assumptions used for Master Plan flows and loads projections with growth assumed in the 2015 draft LUTE currently undergoing CEQA review.

As shown in Table 5-4, the population and housing unit assumptions used for the flows and loads projections are 9 percent greater than the buildout assumptions contained in the currently adopted General Plan, while the amount of non-residential development (in terms of developed floor area) assumed for the flows and loads projections is about 30 percent greater than is assumed in the currently adopted General Plan. Note that the non-residential development projected to occur by 2025 in the currently adopted General Plan has already been surpassed (by about 10 million square feet), as shown in the City’s assessment of existing (2014) conditions included in the NOP for the 2015 draft LUTE (City of Sunnyvale, 2015b) and shown in Table 5-5. Existing industrial, office, and commercial development (47.3 million square feet) is close to the total amount of non-residential development projected to occur under buildout of the 2011 consolidated General Plan (49.0 million square feet).

As shown in Table 5-5, the assumptions about population and housing growth used for the flows and loads projections are essentially the same as the growth assumptions in the 2015 draft LUTE, while the assumptions used for the flows and loads projections reflect slightly more (6 percent) non-residential development than is assumed in the 2015 draft LUTE.

**Santa Clara Valley Water District**

The District is an independent special district with jurisdiction throughout Santa Clara County and is the County’s primary water resources agency. The District’s water supply system consists of storage, conveyance, recharge, treatment, and distribution facilities that include local reservoirs, the groundwater basin, out-of-county groundwater banking, groundwater recharge facilities, treatment plants, imported supply, and raw and treated water conveyance facilities (SCVWD, 2011, Ch 1, p 4; Ch 2, p 8 ).
### TABLE 5-4
**GROWTH ASSUMPTIONS USED FOR FLOWS AND LOADS PROJECTIONS COMPARED WITH 2011 CONSOLIDATED GENERAL PLAN**

<table>
<thead>
<tr>
<th></th>
<th>2011 Consolidated General Plan</th>
<th>Assumptions Used for Flows and Loads</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
<td>2025</td>
<td>Buildout</td>
</tr>
<tr>
<td>Population</td>
<td>132,725</td>
<td>150,725</td>
<td>159,500</td>
</tr>
<tr>
<td>Housing Units</td>
<td>54,300</td>
<td>61,500</td>
<td>65,900</td>
</tr>
<tr>
<td>Industrial/ Office/ Commercial&lt;sup&gt;a&lt;/sup&gt;</td>
<td>30.1</td>
<td>37.7</td>
<td>49.0</td>
</tr>
<tr>
<td>Jobs</td>
<td>84,800</td>
<td>109,600</td>
<td>160,000</td>
</tr>
</tbody>
</table>

<sup>a</sup> Units = million square feet

**SOURCES:** City of Sunnyvale, 2011b; Figure 2-16, pp. 2-30 to 2-31; Carollo and HDR, 2013.

### TABLE 5-5
**GROWTH ASSUMPTIONS USED FOR FLOWS AND LOADS PROJECTIONS COMPARED WITH 2015 DRAFT LUTE<sup>a</sup>**

<table>
<thead>
<tr>
<th></th>
<th>2015 Draft LUTE</th>
<th>Assumptions Used for Flows and Loads</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing (2014)</td>
<td>2035</td>
<td>Existing</td>
</tr>
<tr>
<td>Population</td>
<td>147,055</td>
<td>174,600</td>
<td>141,000</td>
</tr>
<tr>
<td>Housing Units</td>
<td>57,000</td>
<td>72,180</td>
<td>55,400</td>
</tr>
<tr>
<td>Industrial/ Office/ Commercial&lt;sup&gt;b&lt;/sup&gt;</td>
<td>47.3</td>
<td>59.6</td>
<td>46.7</td>
</tr>
<tr>
<td>Jobs</td>
<td>82,000</td>
<td>124,000</td>
<td>77,890</td>
</tr>
</tbody>
</table>

<sup>a</sup> Draft LUTE refers to the Draft Land Use and Transportation Element of the Sunnyvale General Plan.

<sup>b</sup> Units = million square feet

**SOURCES:** City of Sunnyvale, 2015b; Carollo and HDR, 2013.
Urban Water Management Plan

Table 5-6 shows projected water supplies for a normal (or average) rainfall year from 2015 to 2035 presented in the District’s 2010 UWMP. Existing and anticipated supplies exceed demand during average rainfall conditions over most of this period. By 2035, however, water demands are projected to exceed projected new supplies and conservation; the UWMP projects that 3,790 AFY of additional supplies and/or additional conservation will be needed by 2035 to meet demands. The UWMP notes that although carryover storage could be used to make up the difference between supplies and demands, without new supplies or a corresponding reduction in projected demands, carryover storage reserves would be progressively depleted over time; this would leave less reserve supply available for dry years and multiple-dry-year periods. The UWMP further observes that evaluating the water demand and supply system without carryover storage provides “a good indication of the sustainability of the system and identifies the potential need for new supplies” (SCVWD, 2011, Ch. 10, p. 3). Additional supplies and related infrastructure required to fill any identified difference between supplies and demands were expected to be established in the District’s Water Supply and Infrastructure Master Plan (discussed below) (SCVWD 2011, Chapter 10 pp 4-5).

Table 5-7 summarizes the water supply and demand projections, as well as the population projections, presented in the District’s 2010 UWMP. The District’s population projections were based on the ABAG population forecast that was current at the time the UWMP was prepared. As shown, water demand is expected to grow at about half the rate of population growth, indicating increased water use efficiency and lower per capita use over this period.

### Table 5-6

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>State Water Project</td>
<td>64,000</td>
<td>64,000</td>
<td>64,000</td>
<td>64,000</td>
<td>64,000</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Central Valley Project</td>
<td>108,100</td>
<td>108,100</td>
<td>108,100</td>
<td>108,100</td>
<td>108,100</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Local Supplies</td>
<td>145,020</td>
<td>145,020</td>
<td>153,800</td>
<td>153,800</td>
<td>153,800</td>
<td>8,780</td>
<td>6.0%</td>
</tr>
<tr>
<td>Recycled Water</td>
<td>18,680</td>
<td>22,280</td>
<td>25,780</td>
<td>29,180</td>
<td>29,380</td>
<td>10,700</td>
<td>57.0%</td>
</tr>
<tr>
<td>SFPUC</td>
<td>61,000</td>
<td>63,700</td>
<td>63,850</td>
<td>63,850</td>
<td>63,850</td>
<td>2,850</td>
<td>5.0%</td>
</tr>
<tr>
<td>New Supplies/Conservation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3,790</td>
<td>3,790</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total Supplies</strong></td>
<td>396,800</td>
<td>403,100</td>
<td>415,530</td>
<td>418,930</td>
<td>422,920</td>
<td>26,120</td>
<td>7.0%</td>
</tr>
</tbody>
</table>

NOTES: N/A = Not applicable; SFPUC= San Francisco Public Utilities District

- a Includes Department of Safety of Dams interim reservoir operations restrictions for Almaden, Anderson, Calero, Coyote and Guadalupe. Assumes repairs to Anderson will be completed and reservoir may be operated at full capacity starting in 2025 (SCVWD 2011, Table 10-1). This change in reservoir operation accounts for the increase in local supplies shown.
- b SFPUC supplies based on Interim Supply Allocations adopted by SFPUC in December 2010 through 2018 and SFPUC Individual supply guarantees after 2018. Projected use in 2015 and 2020 does not reach available supply limit (65,500 AFY).

SOURCE: Santa Clara Valley Water District, 2011, Table 10-1.

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The UWMP defines carryover storage as “that portion of surface storage, local groundwater storage, and outside the county banked storage that is not required to meet current year demands but could potentially be utilized in subsequent years” (SCVWD, 2011, Ch 10 p3).
### TABLE 5-7
DISTRICT UWMP PROJECTED POPULATION AND AVERAGE-YEAR WATER SUPPLY AND DEMAND SUMMARY

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>1,945,300</td>
<td>2,063,100</td>
<td>2,185,800</td>
<td>2,310,800</td>
<td>2,431,400</td>
<td>486,100</td>
<td>25%</td>
</tr>
<tr>
<td>Supplies (AFY)</td>
<td>396,800</td>
<td>403,100</td>
<td>415,530</td>
<td>418,930</td>
<td>422,920</td>
<td>26,120</td>
<td>7%</td>
</tr>
<tr>
<td>Demand (AFY)</td>
<td>375,720</td>
<td>384,810</td>
<td>396,420</td>
<td>409,370</td>
<td>422,920</td>
<td>47,200</td>
<td>13%</td>
</tr>
</tbody>
</table>

NOTE: AFY = acre-feet per year

a The Urban Water Management Plan cites ABAG’s Projections 2009 as the source for population projections.

b Demand shown is demand after conservation savings and is based on projections from water retailers and water conservation program water savings goals for both urban and agricultural conservation.

SOURCE: Santa Clara Valley Water District, 2011, Table 2-1, Table 10-1.

The UWMP analysis indicates that during a single dry year, supplies from carryover storage (groundwater reserves and groundwater banked outside the county) are needed to meet annual demands in all years, and that carryover storage supplies make up nearly half of the total supplies (SCVWD, 2011, Ch. 10, p. 6). The UWMP analysis of a six-year multiple-dry-year period, based on the historical six dry years 1987 through 1992, indicates that a comparable drought occurring in 2030 through 2035 would require the use of about 67,450 AFY\(^8\) of carryover storage supply, on average, in order to meet annual demands. This estimate for years 2030-2035 assumes implementation of ongoing long-term conservation as well as short-term conservation implemented in response to the drought. The UWMP identifies multiple dry years as the greatest challenge to the District’s water supply. Multiple dry year periods deplete reserves while reliance on the reserves increases as the drought continues (SCVWD, 2011, Ch. 10, pp. 6-9).

The UWMP identifies hydrologic variability, climate change, infrastructure failure, and other uncertainties as potential threats to supply reliability.

**Average-Year Supply Changes 2015-2035.** The UWMP projection of future water supplies (shown above in Table 5-6) indicates that the District anticipated increasing the use of recycled water by about 10,700 AFY by 2035. The UWMP projects that between 2015 and 2035 recycled water supplies would increase by almost 60 percent; however, recycled water would remain a small portion of the total supply portfolio (about 7 percent in 2035) since it represents only about 5 percent of District supplies in 2015. Use of recycled water offsets demand for potable supply that would otherwise be used. The UWMP discussion of recycled water indicated that the District was also investigating the feasibility of indirect potable reuse involving the use of highly purified recycled water to recharge groundwater basins.

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8 This estimate is based on the two years shown for the UWMP’s projected multiple dry year scenario, 2030 and 2035; other information presented in the UWMP indicates that use of carryover storage can vary substantially from year to year and be substantially higher than this.
The increase shown for Local Supplies in Table 5-6 reflects the anticipated restoration of local reservoir operating capacity. Currently the Division of Safety of Dams restricts operation of Anderson Reservoir; the District expects that repairs on the reservoir will be completed and the reservoir returned to operating at full capacity starting in 2025 (SCVWD 2011, Table 10-1). (The availability of the other components that make up local supplies – natural groundwater recharge and surface supplies of the San José Water Company and Stanford University – is not expected to change during this timeframe [SCVWD, 2012, p. 8].)

Total contracted supplies from SFPUC will decrease from 65,500 AFY through 2018 (based on interim supply allocations adopted by SFPUC in 2010) to 63,850 AFY after 2018, based on new supply guarantee agreements between SFPUC and individual Santa Clara County water retailers (SCVWD, 2011, Table 3-6). The apparent increase SFPUC Supplies indicated in Table 5-6 results from the fact that the table corresponding to Table 5-6 in the UWMP shows projected use for 2015 and 2020, which does not reach the supply limit available to the SFPUC’s Santa Clara County water contractors. Overall, the new agreements between SFPUC and Santa Clara County water retailers reduce the total contracted supply from SFPUC by 1,650 AFY.

In summary, the UWMP projects that increase in future water supplies (compared to 2015 supplies) will consist of increased recycled water, increased local supplies from restoration of local reservoir operating capacity, and by 2035, approximately 3,800 AFY of additional new supplies and/or conservation in order to meet projected demands.

Water Supply and Infrastructure Master Plan

The Water Supply and Infrastructure Master Plan (Water Master Plan) (SCVWD, 2012) evaluation of the water supply reliability outlook for the County found that existing supplies are sufficient to meet most future demands in normal year, but will not meet demands in future droughts. The Water Master Plan also identifies several risks that could affect future water supply reliability. Such risks include climate change and changes in regulations and policies that could affect local and imported supply availability.

Table 5-8 shows the projections in the Water Master Plan of average year supplies for 2015 through 2035; these projections are without the new investments proposed in the Water Master Plan and described below. The information varies slightly from that presented in the UWMP. These differences are assumed to result from refinements in the more recent analysis (i.e., the Water Master Plan) and/or differences in the methodology and assumptions used to develop some of the estimates, and are inconsequential to this analysis. Like the UWMP, the Water Master Plan anticipates no change over the 2015-2035 period in supplies conveyed through the Delta (i.e., State Water Project and Central Valley Project supplies), no change supplies available through natural groundwater recharge, and no change in SFPUC supplies. The Water Master Plan anticipates slightly larger net increases in recycled water production by 2035 and in local supplies following reservoir repair and the lifting of restrictions on reservoir operations, and slightly smaller shortfall in supplies compared to demands occurring in 2035 (2,000 acre-feet compared to 3,800 acre-feet estimated in the UWMP). Use of recycled water is projected to increase by about 12,000 AFY between 2015 and 2035. Recycled water is produced by the county’s four publicly owned wastewater treatment plants, including Sunnyvale’s WPCP.
### TABLE 5-8
DISTRICT WATER MASTER PLAN PROJECTED AVERAGE-YEAR SUPPLIES\(^a\) (acre-feet)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Groundwater Recharge</td>
<td>61,000</td>
<td>61,000</td>
<td>61,000</td>
<td>61,000</td>
<td>61,000</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Local Surface Water(^b)</td>
<td>87,000</td>
<td>91,000</td>
<td>93,000</td>
<td>95,000</td>
<td>98,000</td>
<td>11,000</td>
<td>13%</td>
</tr>
<tr>
<td>Recycled Water</td>
<td>18,000</td>
<td>22,000</td>
<td>26,000</td>
<td>29,000</td>
<td>30,000</td>
<td>12,000</td>
<td>67%</td>
</tr>
<tr>
<td>SFPUC</td>
<td>62,000</td>
<td>61,000</td>
<td>61,000</td>
<td>61,000</td>
<td>62,000</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Delta-Conveyed</td>
<td>170,000</td>
<td>170,000</td>
<td>170,000</td>
<td>170,000</td>
<td>170,000</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total Supply</strong></td>
<td>398,000</td>
<td>405,000</td>
<td>410,000</td>
<td>417,000</td>
<td>421,000</td>
<td>23,000</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total Demand</strong></td>
<td>376,000</td>
<td>385,000</td>
<td>396,000</td>
<td>409,000</td>
<td>423,000</td>
<td>47,000</td>
<td>13%</td>
</tr>
</tbody>
</table>

NOTES: SFPUC= San Francisco Public Utilities District
\(^a\) These projections are without the new investments proposed in the Water Master Plan and described in text.
\(^b\) District surface water supplies are currently constrained to an average of about 76,000 AFY by operating restrictions on local reservoirs for seismic safety. These supplies are expected to be restored by 2025, and the District’s local surface water supplies will provide on average 87,000 AFY in 2035. San José Water Company and Stanford University local surface water supplies provide an additional 11,000 AFY.


The plan identifies future droughts as the District’s primary water supply challenge. Due to increasing water demand, shortages during droughts are projected to begin to occur in 2015 and increase in magnitude and frequency over time. Without new supplies or conservation, shortages could occur in about 11 percent of years and supplies would only be able to meet about 70 percent of average demand during some years. Short term water reduction of almost 30 percent would be needed to avoid shortages and minimize the risk of land subsidence (SCVWD, 2012, pp 10-11).

The plan identifies the need for additional water supply investments to meet the county’s future water needs and presents the District’s “Ensure Sustainability” water supply strategy for meeting those needs. The strategy consists of the following three key elements:

- secure baseline supplies and infrastructure
- optimize the use of existing supplies and infrastructure
- increase recycling and water conservation to meet future increases in demands

Securing existing supplies and infrastructure includes participating in recycled water master plan updates, continuing to expand water conservation savings, securing SFPUC supplies, conducting climate change studies, constructing dam seismic retrofits, and securing dry year option agreements, among other actions. Optimizing use of existing supplies and infrastructure is projected to add about 5,000 AFY of supply; this aspect of the water supply strategy includes negotiation and obtaining permits for imported water reoperations, constructing additional groundwater recharge basins, and constructing the Lexington Reservoir pipeline. Increasing recycling and conservation would involve continuing public outreach and engagement on recycled water, monitoring the effectiveness of advanced recycled water treatment and associated...
regulations, and study, design and construction of indirect potable reuse project. This aspect of the strategic plan would add about 20,000 AFY of supply.

**Expedited Program**

As described in Chapter 3, *Project Description* (Section 3.5.3, Need for Water Purification Facilities), District policy and planning documents recognize the need to increase recycled water and potable reuse supplies to meet future demands and, as discussed above, the District’s UWMP and Water Supply and Infrastructure Master Plan project the increasing use of recycled water over time. The current drought, however, now in its fourth year, has lent new urgency to District efforts to increase such supplies. The drought has resulted in significant declines in groundwater levels, which could lead to irreversible land subsidence and potentially catastrophic impacts on the County’s infrastructure and economy. In response to the drought, the District in partnership with others has undertaken an expedited program to investigate potable reuse options and advance the development of potable reuse supplies. The District’s Expedited Recycled and Purified Water Program is intended to provide, by 2035, capability for producing up to 72,000 acre-feet per year of nonpotable recycled water and purified water through partnerships with the four recycled water producers in the county.

**WPF Contribution to District Supplies**

The potable supply that would be provided by the WPF would be conveyed to District facilities and recharged to the groundwater basin where it would be available for later withdrawal and use. The 11,200 to 16,800 AFY of potable water supply that would be provided by the WPF (based on daily production of 10 to 15 mgd) represents 3 to 4 percent of total supplies the District projects for 2035. The 11,200 AFY of purified water that a 10 mgd facility would exceed the UWMP’s projected increase in recycled water supply between 2015 and 2035 (10,700 AFY), most of the increase in recycled water supply projected to be added over this period in the Water Master Plan (12,000 AFY). However, because the WPF would produce purified water for indirect potable reuse and would be used to augment groundwater supplies, it could also be used to replenish groundwater reserves that have been depleted in the current drought and provide supply reliability to meet future dry year demands and offset the 1,650 AFY decrease in SFPUC supplies reflected in contracts (between SFPUC and individual Santa Clara County water retailers) that take effect after 2018, as well as providing new potable water supply that is projected to be needed to meet demands of future growth by 2035. The potable supply provided by the WPF is consistent with the District’s goal of enhancing dry-year supply reliability as well as the need to provide additional new potable supply to meet projected future demands.

**Land Use Planning in the District’s Service Area**

As a water agency, the District does not have authority over land use decisions within the jurisdictions it serves. Responsibility for land use planning and development approval resides with the respective land use planning agencies (i.e., cities and county) in the areas served by the District. Pursuant to state law, each city and county is required to adopt a comprehensive, long-

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term general plan for the physical development of its jurisdiction. The general plan is a statement of development policies and is required to include land use, circulation, housing, conservation, open space, noise, and safety elements. The land use element designates the proposed general distribution, location, and extent of land uses and includes a statement of the standards of population density and building intensity recommended for lands covered by the plan.

5.3 Growth Inducement Potential Conclusions

5.3.1 Significance Threshold

The project would have a significant impact if it induced population growth in an area, either directly or indirectly, that resulted in significant secondary effects on the physical environment.

5.3.2 Impact Analysis

As stated in Section 5.1.2, the proposed project would not directly induce growth because the Master Plan is limited to improvements of the WPCP’s wastewater treatment facilities and the potential to increase production of recycled water and, with implementation of the WPF, the production of purified water to augment the County’s groundwater resources. However, the project could indirectly induce growth in the future by removing insufficient wastewater treatment capacity supply as a potential obstacle to growth and, by offsetting demand for potable water supply or contributing directly to the County’s potable water supply, by removing insufficient water supply as another potential obstacle to growth.

The following conclusions can be drawn from the information presented above in Section 5.2:

- **Level of Growth Accommodated by the Master Plan Exceeds 2011 Consolidated General Plan Population and Housing Development Projections by about 10 percent and Exceeds General Plan Non-Residential Development Projections by about 30 percent.** In the 2011 consolidated General Plan the City noted that an update to the General Plan LUTE was needed and that work on the update would commence in 2012. The fact that existing non-residential development in Sunnyvale (as of 2014), shown above in Table 5-5, exceeds the amount of non-residential development that had been projected for 2025 in the 2011 General Plan substantiates the City’s interest in updating the LUTE. Nevertheless, the 2011 consolidated General Plan is currently the City’s adopted General Plan and the growth assumptions included in it provide a key basis for comparing and evaluating the WPCP capacity needs projected for the Master Planning Period. Such comparison suggests that the Master Plan may provide more capacity than needed by 2035. None of the Master Plan capacity improvements is expected to be needed before 2025. Mitigation is identified below in Section 5.4 to ensure that future capacity improvements under the Master Plan are consistent with the City’s adopted General Plan. Should the draft LUTE currently under review (or an alternative with comparable growth assumptions) be adopted by the City Council before this Program EIR (PEIR) is completed, such mitigation would not be needed.

- **Level of Growth Accommodated by the Master Plan: Consistency with Draft Update of General Plan.** The population and housing unit assumptions used to forecast future loads and residential flows are the same as the population and housing growth assumed in the
2015 draft General Plan LUTE that the City is currently reviewing pursuant to CEQA. The level of non-residential development used to forecast future non-residential flows for the Master Plan is generally consistent (within 6 percent) of the level of non residential growth assumed in the 2015 draft LUTE. If the 2015 draft LUTE were adopted before this PEIR for the Master Plan is completed, this analysis could conclude that the growth assumptions used for the Master Plan were consistent with the City’s General Plan. No capacity improvements would be implemented in the first stage of the Master Plan or first stage of the WPF. As discussed in Section 5.2.1.1, WPCP capacity needs will be reanalyzed before any Stage 2 capacity increases are phased in or digester capacity was added. In addition, because neither the 2015 draft LUTE or the draft LUTE that provided the basis for flows and loads projections has yet been adopted as this Draft PEIR approaches release for public review, mitigation is identified below in Section 5.4 to ensure that future capacity improvements under the Master Plan are consistent with the City’s adopted General Plan. Should the draft LUTE currently under review (or an alternative with comparable growth assumptions) be adopted by the City Council before this PEIR is completed, such mitigation would not be needed.

- **Level of Growth Accommodated by the Master Plan: Consistency with Regional Population Projections.** The population and housing unit assumptions used to forecast future flows and loads are generally consistent with ABAG’s population and household forecasts for Sunnyvale in 2035. Population projections are about 5 percent less than the population ABAG projects and the number of housing units is about 4 percent greater than the number of households projected by ABAG. However, the level of non-residential development assumed for the flows and loads projections appears to be substantially greater than that indicated by ABAG’s jobs projections. ABAG projects about 35 percent fewer jobs for Sunnyvale and its sphere of influence than the number of jobs included with forecasts used for the flows and loads projections. As noted in the first bullet above, a comparison of non-residential development in 2014 and projected non-residential development in the consolidated General Plan indicates that non-residential development in Sunnyvale has proceeded at a faster pace than was anticipated as recently as 2011, suggesting that the draft LUTE forecasts may benefit from more current information than the data underlying ABAG’s forecast.

- **Water Supply Provided by the WPF and Projected Levels of Water Supply and Demand.** The 10 to 15 mgd (or 11,200 to 16,800 AFY) of purified water that would be provided by the WPF for delivery to the District to augment groundwater supplies represents 3 to 4 percent of the District’s projected water supplies in 2035. A 10 mgd WPF facility would provide more than the increase in recycled water production projected in the UWMP (10,700 AFY) and most of the increase in recycled water production projected in the Water Master Plan (12,000 AFY). Alternatively, since the WPF would produce potable water, it could be used to offset the 1,650 AFY decrease in SFPUC supplies reflected in contracts that take effect after 2018 and would be more than sufficient to fill the gap between supply and demand projected to occur in 2035 (a difference of 3,800 C according to UWMP projections and 2,000 AFY according to Water Master Plan projections). As discussed above under “Expedited Program,” the District needs additional water supply to recharge the groundwater basin in order to prevent irreversible land subsidence as a consequence of declining groundwater levels caused by withdrawals during the current drought. Given the volume of supply relative to the projected demand for new water and the recent dramatic decline in groundwater levels that have occurred in the county due to the drought, it is expected that supply provided by the WPF to recharge the groundwater basin would help restore groundwater levels and in the future contribute to groundwater reserves to enhance dry year supply reliability, and could also provide supply to meet projected new demands of future population and job growth.
5.4 Impacts and Mitigation Measures: Secondary Effects of Growth

Impact GI-1: The project would support planned growth in the WPCP and District service areas that would result in secondary effects on the physical environment. Implementation of the project’s wastewater treatment capacity improvements could also support a degree of population and/or employment above that planned for in Sunnyvale’s adopted General Plan.

Master Plan

Implementation of the Master Plan would support planned growth in the WPCP service area due to the increased wastewater treatment capacity the Master Plan would provide. Planned growth would in turn result in indirect effects. In most cases, the effects of planned population and employment growth within the WPCP service area have been identified and addressed in the CEQA documents (e.g., EIRs and mitigated negative declarations) for the general plans and associated specific plans and area plans adopted by Sunnyvale. Some of the indirect effects of planned growth have been identified in the land use plan CEQA documents as significant and unavoidable, while others have been identified as significant but mitigable. Significant unavoidable impacts that could occur as a result of planned growth include: increased traffic congestion, degradation of air quality, increased construction noise, and increased jobs/housing imbalances. In addition, the impact on serpentine grassland habitat from deposition of nitrogen compounds associated with stationary and non-stationary (vehicular) emissions has emerged as an impact of growth in the Santa Clara Valley since most cities’ general plans have been prepared.

In Sunnyvale, Master Plan impacts from growth beyond that evaluated in the CEQA documents for the City’s land use plans could occur because projected future WPCP capacity needs were based on a draft of the City’s Land Use and Transportation Element (LUTE) that anticipates more growth than is envisioned in the currently adopted 2011 consolidated General Plan, and the draft LUTE has not been adopted. To the extent that growth supported by the Master Plan has not been fully analyzed in the EIRs prepared for Sunnyvale’s general plan and related land use plans, the Master Plan would have impacts that are similar to, but potentially more severe than, the impacts identified in the land use plan CEQA documents. Impacts from growth in years beyond those evaluated in the CEQA documents for adopted land use plans would occur due to an increased density of development or the development of additional land area. Impacts from increased density could include additional traffic congestion, air pollution, noise, and demand on public services; land area (or “footprint”) impacts could include the loss of agricultural resources and open space, impacts on wildlife habitat and other biological resources, disturbance of cultural resources, increased soil erosion, and water quality impacts from increased urban runoff. Engineering practice commonly involves updating projections before new facilities are phased in, to ensure they are appropriately sized and avoid over-building facilities. Mitigation Measure GI-1 specifies this action to ensure that all Master Plan capacity increases are consistent with the City’s adopted General Plan. Implementation of this measure would eliminate the potential additional
density- or land-area-related impacts that could occur from growth beyond that addressed in the General Plan. However, the Master Plan would support planned growth in the WPCP service area, resulting in secondary effects of planned growth discussed above.

**WPF**

Implementation of the WPF would enable Sunnyvale to meet its objectives to update and improve WPCP operations and to maximize water recycling opportunities. Implementation of the WPF would enable the District to meet its water supply objectives for the project, including the objectives to develop a local drought-resistant water supply, provide purified water for groundwater recharge, and provide a sustainable water supply for long-term/future demands. Implementation of the WPF would support planned growth in the WPCP service area due to the increased wastewater treatment capacity it would provide, as under the Master Plan. Implementation of the WPF would support planned growth in the District service area to the extent the potable reuse supply provided by the WPF contributes to the District’s supplies to meet future demands. Due to the geology of the groundwater basin it is not expected that WPF water recharged to the groundwater basin (via the existing recharge basins and injection wells the District is considering) would be available to wells in the southern part of the District’s service area (southern Santa Clara County).

Planned growth would in turn result in indirect effects. In most cases, the effects of planned population and employment growth have been identified and addressed in the CEQA documents (e.g., EIRs and mitigated negative declarations) for the general plans and associated specific plans and area plans adopted by Sunnyvale and the other jurisdictions in the District’s service area. Some of the indirect effects of planned growth have been identified in the land use plan CEQA documents as significant and unavoidable, while others have been identified as significant but mitigable. Significant unavoidable impacts that could occur as a result of planned growth include: increased traffic congestion, degradation of air quality, increased noise from both construction and traffic, impacts related to increased greenhouse gas emissions, loss or degradation of sensitive habitats, impacts on serpentine grassland habitat from deposition of nitrogen compounds, change in the visual character of the region, loss of agricultural land, exposure of people to strong seismic ground shaking, intensification of land use, increased jobs/housing imbalances, and impacts on landfill capacity.

In some areas of the District’s service area the WPF could support a degree of population and/or employment growth above that planned for in jurisdictions’ adopted general plans, because the WPF has a longer planning horizon. To the extent that growth supported by the WPF has not been fully analyzed in the EIRs prepared for the general plans and related land use plans of jurisdictions in the District’s service area, the WPF would have impacts that are similar to, but potentially more severe than, the impacts identified in local general plan CEQA documents. Impacts from growth in years beyond those evaluated in the CEQA documents for adopted land use plans would occur due to an increased density of development or the development of additional land area. Impacts from increased density could include additional traffic congestion, air pollution, noise, and demand on public services; land area (or “footprint”) impacts could include the loss of agricultural resources and open space, impacts on wildlife habitat and other
biological resources, disturbance of cultural resources, increased soil erosion, and water quality impacts from increased urban runoff.

In Sunnyvale, WPF impacts from growth beyond that evaluated in the CEQA documents for the City’s land use plans could occur because projected future WPCP capacity needs were based on a draft of the City’s Land Use and Transportation Element (LUTE) that anticipates more growth than is envisioned in the currently adopted 2011 consolidated General Plan, and the draft LUTE has not been adopted. Engineering practice commonly involves updating projections before new facilities are phased in, to ensure they are appropriately sized and avoid over-building facilities. **Mitigation Measure GI-1** specifies this action to ensure that all WPF capacity increases are consistent with the City’s adopted General Plan. Implementation of this measure would eliminate the potential additional density- or land-area-related impacts that could occur from growth beyond that addressed in the General Plan. However, the WPF would support planned growth in the WPCP and District service areas, resulting in secondary effects of planned growth discussed above.

**Mitigation Measures**

**Mitigation Measure GI-1: Update Projections**

Prior to implementation of Stage 2 of the conventional activated sludge and Stage 2 of solids thickening and dewatering facilities and processes, Stage 2 of the MBR facilities and Stage 2 of WPF solids thickening and dewatering facilities, or construction of a fifth digester, the City will: (1) initiate a new investigation of flows and loads capacity requirements to ensure that these facilities are appropriately sized to accommodate projected capacity needs consistent with (then) adopted plans and policies; and (2) require that CEQA documents on development projects evaluate nitrogen deposition impacts on serpentine habitat and associated special-status species, and mitigate significant project-specific and cumulative impacts to less-than-significant levels. The analysis requirements and specific mitigation strategy(ies) will depend on the environmental setting at the time the Master Plan or WPF improvements are implemented, characteristics of the proposed development, and its relative contribution to the significant impact.

**5.4.1 Secondary Effects**

The following environmental documents for cities’ and the County’s general plans, general plan amendments, specific plans, and related planning documents were reviewed in order to (1) identify the secondary effects of planned growth in Sunnyvale that would be supported, in part, by implementation of the Master Plan and (2) the secondary effects of growth in the District’s service area that would be supported, in part, by implementation of the WPF:

- City of Sunnyvale, Moffet Park Specific Plan Draft Environmental Impact Report and Final EIR and Response to Draft EIR Comments, State Clearinghouse #2001052121, January 2003;
- Moffet Place Draft Subsequent Environmental Impact Report (August 2013) and Final Subsequent Environmental Impact Report and Responses to Draft SEIR Comments, State Clearinghouse #2013022025; October 2013;
City of Campbell, Responses to Comments Addendum: Final Environmental Impact Report, Campbell Draft General Plan, SCH#2001042063, September 2001 and Environmental Impact Report, Campbell Draft General Plan, SCH#2001042063, July 26, 2001


City of Monte Sereno, Initial Study for the Comprehensive Update of the Monte Sereno General Plan including Housing Element, Negative Declaration for the Housing Element adopted June 2010

City of San José, Envision San José 2040 General Plan Program Environmental Impact Report, June 2011


City of Saratoga, 2007–2014 Housing Element Initial Study and Negative Declaration, January 2010; 2007 Land Use/Open Space Element Update Initial Study and Negative Declaration, certified June 2007

Town of Los Gatos, Town of Los Gatos 2020 General Plan Environmental Impact Report (Draft), March 10, 2010

County of Santa Clara, Santa Clara County General Plan Draft Environmental Report (September 2004) and Final Environmental Impact Report Addendum, State Clearinghouse #94023004, November 1994 and Resolution of the Board of Supervisors of the County of Santa Clara Recommending Certification of Final Impact Report, Adopting Related Overriding Considerations and Monitoring Program, and Adoption of the County General Plan, December 20, 1994

Copies of these documents are available for review at the respective city and county planning departments. Table E-1 in Appendix E summarizes the growth impacts identified in the EIRs for general plans for the WPCP and District service areas.

**Authority to Mitigate Effects of Growth**

The authority to regulate growth, and by extension to mitigate the environmental effects of growth, resides primarily with land use planning agencies. In general, the City’s authority to approve or deny urban development or to impose mitigation for the environmental consequences of such development is limited to Sunnyvale and its sphere of influence. As a special district, the
District does not have authority over land use decisions within the jurisdictions it serves. Table 5-9 identifies agencies with the authority to implement measures to avoid or mitigate the environmental impacts of growth in the WPCP and District services areas; the agencies generally fall into two categories, as discussed below.

- Agencies with primary authority over land use planning and CEQA lead agency status for approval of land use plans, permits and other approvals.
- Agencies responsible for stewardship of environmental resources.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planning Agencies</strong></td>
<td></td>
</tr>
<tr>
<td>City of Sunnyvale and cities within the District’s Service Area</td>
<td><strong>Planning and Enforcement.</strong> Responsible for planning, land use, and environmental protection of the area within the city’s jurisdictional boundaries and adoption of the general plan governing this area. Responsible for enforcing city environmental policies through zoning and building codes and ordinances. <strong>CEQA.</strong> Cities typically act as the lead agency for CEQA compliance for development projects in incorporated areas; as such they bear responsibility for adopting measures to mitigate the project’s significant direct and indirect impacts on the environment and programs to ensure that mitigation measures are successfully implemented.</td>
</tr>
<tr>
<td>Santa Clara County</td>
<td><strong>Planning and Enforcement.</strong> Responsible for planning, land use, and environmental protection of unincorporated areas and adoption of the general plan governing unincorporated county lands. Responsible for enforcing County environmental policies through zoning and building codes and ordinances. <strong>CEQA.</strong> Counties typically act as the lead agency for CEQA compliance for development projects in unincorporated areas; as such they bear responsibility for adopting measures to mitigate the project’s significant direct and indirect impacts on the environment and programs to ensure that mitigation measures are successfully implemented.</td>
</tr>
<tr>
<td>Association of Bay Area Governments and Metropolitan Transportation Commission</td>
<td>Tasked with creating a “Sustainable Community Strategy” for the nine-county Bay Area through integrated land use and transportation planning, and demonstrating ability to attain the proposed greenhouse gas emissions reduction targets.</td>
</tr>
<tr>
<td>Local Agency Formation Commission</td>
<td>Empowered to approve or disapprove all proposals to incorporate cities, to form special districts, or to annex territories to cities or special districts. Also empowered to guide growth of governmental service responsibilities.</td>
</tr>
<tr>
<td>San Francisco Bay Conservation and Development Commission</td>
<td>A state agency responsible for regulating development adjacent to San Francisco Bay. Under the federal Coastal Zone Management Act, exercises federal consistency review authority over all federal activities and federally licensed, permitted or assisted activities that affect resources within the San Francisco Bay segment of the California coastal zone.</td>
</tr>
<tr>
<td><strong>Multiple Resources</strong></td>
<td></td>
</tr>
<tr>
<td>U.S. Environmental Protection Agency</td>
<td>Responsible for writing regulations and setting national standards to implement a variety of federal environmental protection and human health laws. In California, EPA has delegated much of the authority to enforce the Clean Air Act, Clean Water Act and Drinking Water Quality Act to state agencies while retaining some oversight. EPA also comments on the environmental review of projects through its participation in the NEPA process.</td>
</tr>
</tbody>
</table>
### TABLE 5-9 (Continued)
**AGENCIES WITH THE AUTHORITY TO IMPLEMENT OR REQUIRE IMPLEMENTATION OF MEASURES TO AVOID OR MITIGATE GROWTH-RELATED IMPACTS**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Resources</strong></td>
<td></td>
</tr>
<tr>
<td>State Water Resources Control Board (SWRCB)</td>
<td>Shares responsibility with the regional water quality control boards (RWQCBs) to protect and restore water quality; approves regional basin plans; provides administrative and other support to regional boards; and administers surface water rights. Develops water quality control plans and policies in certain instances where water quality issues cross regional boundaries or have statewide application.</td>
</tr>
<tr>
<td>San Francisco Bay RWQCB</td>
<td>Shares responsibility with SWRCB to protect and restore water quality. Formulates and adopts water quality control plans. Implements portions of the Clean Water Act when EPA and SWRCB delegate authority, as is the case with issuance of NPDES permits for waste discharge, reclamation, and stormwater drainage.</td>
</tr>
<tr>
<td>California Department of Public Health</td>
<td>Responsible for the purity and potability of domestic water supplies. Assists SWRCB and RWQCBs in setting water quality standards.</td>
</tr>
<tr>
<td><strong>Air Resources</strong></td>
<td></td>
</tr>
<tr>
<td>California Air Resources Board</td>
<td>Responsible for adopting and enforcing standards, rules, and regulations for the control of air pollution from mobile sources throughout the state. Also responsible for developing plans and regional reduction targets for greenhouse gas emissions.</td>
</tr>
<tr>
<td>Bay Area Air Quality Management District</td>
<td>Adopts and enforces local regulations governing stationary sources of air pollutants for the San Francisco Bay Area. Issues Authority to Construct Permits and Permits to Operate. Provides compliance inspections of facilities and monitors regional air quality. Develops Clean Air Plans in compliance with the Clean Air Act. Publishes guidelines to guide lead agencies in evaluating and mitigating air quality impacts.</td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td></td>
</tr>
<tr>
<td>National Oceanic and Atmospheric</td>
<td>Requires consultation under Section 7 or Section 10 of the Endangered Species Act for projects which could potentially impact endangered or threatened species under the purview of National Marine Fisheries Service. Prepares biological opinions on the status of species in specific areas and potential effects of proposed projects. Approves reasonable and prudent measures to reduce impacts and establishes Habitat Conservation Plans.</td>
</tr>
<tr>
<td>Administration National Marine Fisheries Service (NMFS)</td>
<td></td>
</tr>
<tr>
<td>U.S. Fish and Wildlife Service (USFWS)</td>
<td>Requires consultation under Section 7 or Section 10 of the Endangered Species Act for projects which could potentially impact endangered or threatened species. Prepares biological opinions on the status of species in specific areas and potential effects of proposed projects. Approves reasonable and prudent measures to reduce impacts and establishes Habitat Conservation Plans.</td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers</td>
<td>Issues permits to place fill in waters of the United States, including wetlands, pursuant to the Clean Water Act. Required to consult with USFWS and NMFS regarding compliance with the federal Endangered Species Act.</td>
</tr>
<tr>
<td>California Department of Fish and Game</td>
<td>Issues Stream Bed Alteration Agreements for projects potentially impacting waterways. Issues incidental take permits for projects that would result in the take of species listed under the California Endangered Species Act if specific criteria are met. Under the Natural Community Conservation Planning Act, provides oversight for the development of regional Natural Community Conservation Plans that aim to balance ecosystem protection and land use.</td>
</tr>
</tbody>
</table>

* These agencies fall under the umbrella of the California Environmental Protection Agency

SOURCE: ESA
Implementation of Environmental Protection Measures by Land Use Planning Agencies. Cities and counties (for unincorporated areas) have the greatest authority over land use decisions within their jurisdictions through implementation of their general plans, locally adopted ordinances and regulations to regulate growth, and development approval processes. Some ordinances and policies adopted at the local level (e.g., ordinances establishing urban growth limit lines, protecting natural resources such as riparian habitat, or establishing resource conservation easements) are intended to avoid or reduce environmental impacts.

In their capacities as lead agencies under CEQA (PRC Section 21002 and Section 21067), cities and counties also have the authority and responsibility to evaluate the environmental impacts that would result from implementation of plans and individual development projects within their jurisdictions, and to adopt measures to mitigate any significant adverse impacts. Cities and counties are required to identify mitigation measures in the CEQA documents on these plans and projects, and to adopt feasible measures within their authority, as well as programs to monitor and report on their implementation, as conditions of approval.

The San Francisco Bay Conservation and Development Commission also exercises authority over land uses within areas adjacent to San Francisco Bay and can impose measures to mitigate adverse environmental effects of development within its jurisdiction through its approval processes.

Implementation of Environmental Protection Measures by Resource Management Agencies. Mitigation of impacts relating to specific resources categories generally falls under the responsibility of resource-specific agencies at the federal, state, and regional levels through permitting and related regulatory processes summarized in Table 5-9. Through their permitting authority these agencies mitigate the impacts of proposed land uses and enforce the provisions of adopted resource protection plans (e.g., water basin plans and air basin plans). For example, the San Francisco Bay RWQCB identifies specific requirements and water quality standards for facilities through issuance of waste discharge requirements and the BAAQMD mitigates the effects of pollutant emissions through issuance of permits to construct and operate stationary sources of air emissions.

Conclusion: Significant and Unavoidable. The Master Plan would not directly contribute to the creation of additional housing or jobs within the WPCP service area because the project is limited to the provision of wastewater treatment infrastructure and capacity, changes in land use designations, and infrastructure improvements to support future development of certain areas of the Plant property. However, the project would indirectly support growth by removing obstacles to growth, thereby enabling growth under the approved general plans within the WPCP and District service areas to occur. Mitigation Measure GI-1 would ensure that the Master Plan would not result in additional or more severe impacts associated with growth beyond that evaluated in the CEQA documents prepared for the City’s current General Plan.

The City has the authority to approve or deny development projects and to impose mitigation to address significant environmental impacts associated with development projects within the City’s jurisdiction. Authority to approve or deny development projects and impose mitigation elsewhere within the District’s service area resides with the other cities or Santa Clara County. In
addition, numerous federal, state, regional and local agencies are specifically charged with protecting environmental resources, and ensuring that planned development occurs in a sustainable manner. Together, these agencies exercise the authority to reduce the effects of development on the environment; however, as identified by these local jurisdictions and summarized in Table E-1, some unavoidable impacts would still be expected to occur.

5.5 References

Association of Bay Area Governments, 2013, Plan Bay Area Projections 2013 (Subregional Study Area data for Santa Clara County).


City of Milpitas, Resolution No. 7150: A Resolution of the City Council of the City of Milpitas Certifying an Environmental Impact Report for the Milpitas Midtown General Plan Amendment and Specific Plan Project and Adopting Related Mitigation Findings, Findings Regarding Alternatives, A Statement of Overriding Considerations and a Mitigation Monitoring and Reporting Plan Pursuant to the California Environmental Quality Act, March 19, 2002b.

City of Monte Sereno, Initial Study for the City of Monte Sereno General Plan Update (Negative Declaration for the Housing Element adopted June 2010) 2010a.

City of Monte Sereno, Monte Sereno City Council Minutes, Item 10, adoption of Negative Declaration of Environmental Impact For the Proposed Housing Element Revision to the General Plan, June 1, 2010b.

City of San José, Envision San José 2040 General Plan Program Environmental Impact Report, June 2011.


City of Sunnyvale, 2015b. Reissued Notice of Preparation, Sunnyvale Land Use and Transportation Element (LUTE) Update (SCH #2012032003).

County of Santa Clara, Santa Clara County General Plan Draft Environmental Report (September 2004) and Final Environmental Impact Report Addendum, State Clearinghouse #94023004, November 1994 and Resolution of the Board of Supervisors of the County of Santa Clara Recommending Certification of Final Impact Report, Adopting Related Overriding Considerations and Monitoring Program, and Adoption of the County General Plan, December 20, 1994


Town of Los Gatos, Town of Los Gatos 2020 General Plan Environmental Impact Report (Draft), March 10, 2010.
CHAPTER 6
Cumulative Impacts and Other CEQA Issues

<table>
<thead>
<tr>
<th>Sections</th>
<th>Tables</th>
<th>Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 Approach to Cumulative Impacts Analysis</td>
<td>6-1 List of Projects Evaluated For Cumulative Impacts in the WPCP Project Vicinity</td>
<td>6-1 Cumulative Projects</td>
</tr>
<tr>
<td>6.2 Cumulative Impact Analysis</td>
<td>6-2 Summary of the Master Plan’s Contribution to Cumulative Impacts</td>
<td></td>
</tr>
<tr>
<td>6.3 Significant Environmental Effects That Cannot Be Avoided if the Proposed Project is Implemented</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.4 Significant Irreversible Environmental Changes</td>
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<tr>
<td>6.5 References</td>
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</table>

6.1 Approach to Cumulative Impact Analysis

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are “considerable” or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of the project when added to those of other closely related past, present, or reasonably foreseeable future projects. Pertinent guidance for cumulative impact analysis is provided in Section 15130 of the CEQA Guidelines:

- An environmental impact report (EIR) shall discuss cumulative impacts of a project when the project’s incremental effect is “cumulatively considerable” (e.g., the incremental effects of an individual project are considerable when viewed in connection with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- A project’s contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.
The cumulative impact analysis for each individual resource topic is included below in Section 6.2.

Two approaches to a cumulative impact analysis are provided in CEQA Guidelines Section 15130(b)(1): (a) the analysis can be based on a list of past, present, and probable future projects producing related or cumulative impacts; or (b) a summary of projections contained in a general plan or related planning document can be used to determine cumulative impacts. For the purpose of this Program EIR (PEIR), unless otherwise noted, the analyses employ the list-based approach. The following factors were used to determine an appropriate list of projects to be considered in this cumulative analysis:

- **Similar Environmental Impacts.** A relevant project contributes to effects on resources that are also affected by the proposed project. A relevant future project is defined as one that is “reasonably foreseeable,” such as a project for which an application has been filed with the approving agency or has approved funding.

- **Geographic Scope and Location.** A relevant project is located within the defined geographic scope for the cumulative effect.

- **Timing and Duration of Implementation.** Effects associated with activities for a relevant project (e.g., short-term construction or demolition, or long-term operations) would likely coincide in timing with the effects of the proposed project.

Design and construction of the Water Pollution Control Plant (WPCP) improvements would occur over a 20-plus years (refer to Figures 3-4 and 3-11 in Chapter 3, *Project Description*). Consistent with CEQA, the environmental setting described in Chapter 4 reflects conditions that existed generally at the time that the Notice of Preparation for this PEIR was published. In the future, the setting will reflect on-going changes in the natural and built environments. Cumulative impacts discussed below are considered in the context of these shifts in the environmental setting.

Regarding the proposed Water Purification Facilities (WPF), the analysis of cumulative impacts is limited by the extent to which most components of the WPF have been defined. For example, the geographic context for impacts like noise is the immediate vicinity of a given project site (i.e., the nearest sensitive receptors). No specific sites have been identified for the injection wells or pipelines; consequently, the potential for significant cumulative noise impacts to occur in association with construction and operation of these components cannot be assessed at this time and must be addressed in project-specific CEQA documentation on those facilities.

### 6.1.1 List of Relevant Projects

*Table 6-1* describes past, present, and reasonably foreseeable future projects and activities near the Master Plan planning area that potentially could contribute to significant cumulative impacts. Projects with schedules overlapping the Master Plan are shaded; other projects at the WPCP are italicized. *Figure 6-1* shows the general location of cumulative projects listed in Tables 6-1. Projects that are relevant to the cumulative analysis include those that could contribute incremental effects on the same environmental resources and would have environmental impacts similar to those discussed in this PEIR. The discussions below analyze the potential cumulative impacts that could occur when the impacts of the proposed project are considered in combination with the impacts of other past, present, and reasonably foreseeable future projects.
### TABLE 6-1
LIST OF PROJECTS EVALUATED FOR CUMULATIVE IMPACTS IN THE WPCP PROJECT VICINITY

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Project Title</th>
<th>Project Summary</th>
<th>Estimated Construction Schedule</th>
<th>Project Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANTA CLARA COUNTY</td>
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<tr>
<td>Santa Clara Valley Water District (District)</td>
<td>Sunnyvale East and West Channels Flood Protection Project</td>
<td>Construction along the East and West Channels to protect Sunnyvale from 100-year riverine flooding and to improve water quality. Includes floodwalls, levee and maintenance road improvements, bridge/culvert modifications, sediment removal, and stabilization of stream bank sections. Components near the WPCP include construction of inboard and outboard floodwalls between the main plant and Moffett Channel, inboard floodwall between Moffett Channel and Cargill Channel, and levee improvements along the West Channel between the landfills.</td>
<td>Construction could begin in 2016 and extend through 2018.</td>
<td>The West Channel borders the western side of the main plant; the East Channel borders the eastern edge of the Sunnyvale Landfill.</td>
</tr>
<tr>
<td>District, U.S. Army Corps of Engineers (USACE)</td>
<td>South San Francisco Bay Shoreline Study</td>
<td>Study being performed to identify and recommend for Federal funding projects for flood hazard reduction, ecosystem restoration and related purposes such as public access for the Santa Clara County baylands, from Palo Alto to Southern Alameda County. The first phase of the Study focuses on the area between Alviso Slough and Coyote Creek, located east of the Sunnyvale WPCP. The final EIR/Environmental Impact Statement (EIR/EIS) for this phase was released in September 2015, and construction could begin in 2017 at the earliest (South Bay Shoreline Study, 2015). Regarding future phases of the Study, the District is currently analyzing the existing conditions along Palo Alto, Mountain View, and Sunnyvale’s shorelines in order to better scope the level of effort needed to address flood protection and habitat restoration. Traveling from east to west, the preliminary shoreline levee alignment runs between SCVWD Pond A4 and the main plant and landfills, turns northward along the western side of Moffett Channel, encompasses the oxidation ponds, then continues west along the shoreline of Moffett Field. As described in Chapter 3, the City of Sunnyvale is proposing a flood wall around the main plant to address tidal flood hazards and intends to work with agencies like the District and USACE regarding tidal flood protection for wastewater treatment operations outside the main plant (i.e., Ponds 1 and 2 for as long as they continue to provide secondary treatment, and the diurnal equalization/emergency storage facilities).</td>
<td>Construction could begin in 2017 in the Alviso area.</td>
<td>Sunnyvale WPCP is within Shoreline Study area.</td>
</tr>
<tr>
<td>California State Coastal Conservancy, U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife</td>
<td>South Bay Salt Pond Restoration Project, Phase 2</td>
<td>Phase 2 consists of restoration and related activities at three pond clusters in the Alviso pond complex and at ponds in the Ravenswood pond complex. Includes wetland habitat restoration, improved flood management, and improved public access and recreation. The overall restoration efforts would eventually convert 90 percent of the former salt ponds to tidal marsh, while 10 percent would remain enhanced managed ponds. Also includes a monitoring and adaptive management program. Phase 2 actions at Ponds A8 and A8S consist of using fill material to construct upland transition zones in the southern corners of Pond A8S.</td>
<td>Construction could begin in summer 2016 and extend for approximately 35 months over five construction seasons.</td>
<td>Pond clusters in the Alviso pond complex and ponds in Ravenswood complex near East Palo Alto. Alviso Ponds A8 and A8S are closest to the WPCP, just east of SCVWD Pond A4.</td>
</tr>
</tbody>
</table>
TABLE 6-1 (Continued)
LIST OF PROJECTS EVALUATED FOR CUMULATIVE IMPACTS IN THE WPCP PROJECT VICINITY

<table>
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<tbody>
<tr>
<td>SANTA CLARA COUNTY (cont.)</td>
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<tr>
<td>Santa Clara Valley Water District</td>
<td>Expedited Recycled and Purified Water Program</td>
<td>Establishment of advanced treatment and purified water conveyance systems and associated groundwater replenishment mechanisms to support up to 72,000 acre-feet per year of nonpotable recycled water and purified water. In addition to the Sunnyvale WPF considered at a program level in this PEIR, components of the Expedited Program would include expanding existing advanced treatment at the Silicon Valley Advanced Water Purification Center, purified water pipelines, siting additional recharge basins, and installing injection wells. See also Section 2.3.1 in Chapter 2 of this PEIR.</td>
<td>Construction estimated to begin in 2019.</td>
<td>Locations of conveyance pipelines currently unknown. Groundwater replenishment locations include the existing Los Gatos recharge basins (Campbell), areas near the existing Ford recharge basin (southern San José), the mid-basin area (between Campbell and Santa Clara) and the westside basin area (near Saratoga).</td>
</tr>
<tr>
<td>California High-Speed Rail Authority</td>
<td>California High Speed Rail</td>
<td>High-speed rail project from San Francisco to Los Angeles/Anaheim, and later to Sacramento and San Diego. Stations in Santa Clara County planned in San José and Gilroy.</td>
<td>Construction expected to occur from 2021 to 2026.</td>
<td>Within Santa Clara County.</td>
</tr>
<tr>
<td>Santa Clara Valley Water District</td>
<td>Stream Maintenance Program</td>
<td>Flood management program with the goal to maintain the design flow or appropriate conveyance capacity of District facilities, and to maintain the structural and functional integrity of District facilities.</td>
<td>Planned between 2012-2022.</td>
<td>Within Santa Clara County.</td>
</tr>
<tr>
<td>Santa Clara Valley Transportation Authority</td>
<td>Santa Clara Valley Transportation Plan 2040 (VTP 2040)</td>
<td>The long-range transportation plan for the Santa Clara Valley. VTP 2040 identifies programs, projects, and policies that Santa Clara Valley Transportation Authority’s (VTA) Board of Directors is going to pursue over the lifetime of the plan. Part of the Tasman Express Light Rail Improvement Project will occur south of the WPCP at the intersection of Caribbean Drive and Java Drive. Part of the State Route (SR) 237 Express Lanes: North First St. to Mathilda Avenue project and SR 237 Eastbound Auxiliary Lanes: Mathilda Avenue to Fair Oaks Avenue will occur south of the WPCP. The Lawrence Expressway Ramp Improvements at SR 237 will also occur south of the WPCP. Within the vicinity of the WPCP, the VTP 2040 also includes a multi-use bicycle and pedestrian trails along the Sunnyvale East Channel between Moffett Park Drive and Caribbean Drive and Persian Drive to Tasman Drive, and along the Sunnyvale West Channel from Mathilda Avenue to the Bay Trail.</td>
<td>Planned between 2016 and 2040.</td>
<td>Within Santa Clara County; closest projects occur approximately 0.5 miles south of the WPCP.</td>
</tr>
</tbody>
</table>
### TABLE 6-1 (Continued)

**LIST OF PROJECTS EVALUATED FOR CUMULATIVE IMPACTS IN THE WPCP PROJECT VICINITY**

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<td><strong>CITY OF SUNNYVALE</strong></td>
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<tr>
<td>City of Sunnyvale</td>
<td>Sunnyvale WPCP Primary Treatment Facility</td>
<td>The City will construct new preliminary and primary treatment facilities at the WPCP as part of its Primary Treatment Facility project. Figure 3-5 in Chapter 3 of this PEIR shows the facilities that will be constructed as part of the Primary Treatment Facility Project.</td>
<td>2016-2019.</td>
<td>At WPCP main plant.</td>
</tr>
<tr>
<td>City of Sunnyvale</td>
<td>Sunnyvale WPCP Oxidation Pond Maintenance Project</td>
<td>The project uses a floating hydraulic suction dredge on the oxidation ponds to remove accumulated sludge from the ponds’ bottoms. The sludge is then dewatered and transported offsite for reuse or disposal. The project is currently underway.</td>
<td>Present through 2016.</td>
<td>At WPCP oxidation ponds.</td>
</tr>
<tr>
<td>City of Sunnyvale</td>
<td>Ongoing WPCP improvements</td>
<td>The City is completing hydraulic modifications to the filtration and disinfection facilities to allow for continuous production of Title 22 recycled water. Other ongoing WPCP improvements include reconstruction of two of the four anaerobic digesters, procurement of a portable standby generator which could be utilized on an as-needed emergency basis, and facility improvements associated with changing the source of chlorine used for disinfection from gaseous chlorine to sodium hypochlorite.</td>
<td>Ongoing through 2035.</td>
<td>At the WPCP.</td>
</tr>
<tr>
<td>City of Sunnyvale and District</td>
<td>City of Sunnyvale Joint Use Agreements with the Santa Clara Valley Water District</td>
<td>The District and Sunnyvale may enter into a Cost Sharing Agreement and Joint Use Agreement (JUA) to provide public access to the District’s maintenance roads along the Sunnyvale Channels for recreational use (i.e., Class I Bike Facilities), which is part of the trail component included in the Sunnyvale East and West Channels Flood Protection Project. If agreement is established, the City would pay for District to pave several stretches of its existing maintenance roads, including; along the Sunnyvale East Channel from the John W. Christian Greenbelt to Tasman Drive and from Moffett Park Drive to Caribbean Drive; and along the West Channel from N. Mathilda Avenue to Caribbean Drive. A Cost Sharing Agreement for payment to the District for the trails and a JUA between the City and the District has been drafted but still needs to go to the District Board for approval, anticipated to occur sometime in the beginning of 2016.</td>
<td>2016-2018.</td>
<td>Nearest paving would occur approximately 0.1 mile from the WPCP.</td>
</tr>
<tr>
<td>City of Sunnyvale</td>
<td>1111 Lockheed Martin Way</td>
<td>This project would develop a 47-acre parcel into five 8-story office/R&amp;D buildings, four parking structures and an amenity building for a total floor area of about 1.7 million square feet and 80% floor area ratio. Project approvals include a General Plan Amendment to modify the Moffett Park Specific Plan, rezoning, Special Development Permit for site and architectural review, and an Environmental Impact Report.</td>
<td>Unknown Project application filed with the City of Sunnyvale on April 5, 2015.</td>
<td>Adjacent to and southwest (landward) of Oxidation Pond 2.</td>
</tr>
<tr>
<td>City of Sunnyvale</td>
<td>549 Baltic Way NetApp Expansion</td>
<td>This project would redevelop two parcels, known as Site 3, within the Moffett Park industrial area with two 5- story office buildings as part of the expansion of the NetApp campus.</td>
<td>Planned to start in 2020.</td>
<td>Approximately 0.5 mile southeast of WPCP.</td>
</tr>
</tbody>
</table>
### TABLE 6-1 (Continued)
LIST OF PROJECTS EVALUATED FOR CUMULATIVE IMPACTS IN THE WPCP PROJECT VICINITY

<table>
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<tr>
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<th>Project Location</th>
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<tbody>
<tr>
<td>CITY OF SUNNYVALE (cont.)</td>
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<td></td>
</tr>
<tr>
<td>City of Sunnyvale</td>
<td>Former Onizuka Air Force Station Redevelopment Plan</td>
<td>The Onizuka Air Force Station Redevelopment Plan is a Reuse Plan for the Onizuka Air Force Station consisting of a land transfer, completed June 2013, to the new property owners including the City of Sunnyvale, Foothill De-Anza Community College District and the Veterans Administration (VA). The VA plans to use 4.4 acres for a research laboratory. The Department of Education sponsored a Public Benefit Conveyance to Foothill-De Anza Community College for 9.2 acres to build a new regional education facility at the site. The Air Force has also transferred 4.6 acres to the City of Sunnyvale through a collaborative exchange agreement between the City, the Air Force, the U.S. Department of Housing and Urban Development, Mid-Peninsula Housing Coalition, and the Charities Housing Development Corporation. The City of Sunnyvale Fire Department also received one acre through the Federal Emergency Management Agency and plans to use the land to expand its current fire station operations at the site.</td>
<td>Unknown. Land transfer from U.S. Air Force completed June 2013.</td>
<td>1080 Innovation Way, approximately 1 mile southwest of the WPCP</td>
</tr>
<tr>
<td>City of Sunnyvale</td>
<td>Moffett Place Planning Project</td>
<td>Proposed development of an approximately 55 acre office complex. A Specific Plan Amendment to the Moffett Park Specific Plan to change zoning and allowable floor area ratio.</td>
<td>Timing uncertain; duration approximately 16 to 64 months from construction start.</td>
<td>Approximately 1 mile southwest of the Project, near the intersection of Moffett Park Drive and N. Mathilda Avenue.</td>
</tr>
<tr>
<td>City of Sunnyvale</td>
<td>Sunnyvale Land Use and Transportation Element (LUTE) General Plan Update</td>
<td>The General Plan LUTE establishes the framework for how streets and buildings will be laid out in City and how land uses, developments, and transportation facilities will function together. The LUTE Update, which is currently undergoing CEQA review, will include land use and transportation policies, action statements, and strategies that provide direction for growth and change in the City to year 2035.</td>
<td>Scheduled to be published in 2016; will govern development through 2035.</td>
<td>WPCP is within the plan area.</td>
</tr>
<tr>
<td>City of Sunnyvale</td>
<td>City of Sunnyvale Sewer System Management Plan</td>
<td>Management plan includes the policies, procedures, and activities for the planning, management, operation, and maintenance of the City’s sanitary sewer system, including sewer lift station rebuilds, siphon cleaning, salinity reduction study, replacement of supervisory control system, and replacement, repair, rehabilitation of sanitary sewer lines.</td>
<td>Various projects occurring from 2016 to 2024</td>
<td>Main sewer trunk lines located in Borregas Avenue and Caribbean Drive. Nearest sewer lift station approximately 1 mile southeast of WPCP.</td>
</tr>
</tbody>
</table>
California High Speed Rail Project (San Francisco to San Jose Section)

Expected Recycled and Purified Water Program (locations not yet determined not mapped)

Former Onizuka Airforce Station Redevelopment Plan (multiple locations; map shows site nearest WPCP)

Moffett Field Planning Project

San Jose/Santa Clara Regional Wastewater Facility Master Plan

South San Francisco Bay Shoreline Phase 1 Study Area

South Bay Salt Pond Restoration Project Phase 2

Stream Maintenance Program (various streams in Santa Clara County not mapped)

Sunnyvale East and West Channels

Flood Protection Project

Sunnyvale Land Use and Transportation Element Update (not mapped)

Sunnyvale Water Pollution Control Plant Primary Treatment Facility

Sunnyvale Water Pollution Control Plant Oxidation Pond Maintenance

Sunnyvale Sewer System Management Plan (multiple locations throughout City not mapped)

VTP2040 - The Long Range Transportation Plan for Santa Clara County

549 Baltic Way

1111 Lockheed Martin Way

* The entire South Bay Shoreline Study area covers the southern portion of the South Bay, stretching from Fremont to Palo Alto.

** The entire South Bay Salt Pond project encompasses approximately 15,100 acres of former salt-evaporation ponds divided into three pond complexes: Eden Landing near Hayward, Ravenswood near East Palo Alto, and Alviso. The Alviso pond complex includes former salt ponds to the west, north and east of the Sunnyvale WPCP's Ponds 1 and 2 and the District's Pond A4.
6.2 Cumulative Impact Analysis

Table 6-2, below, provides a summary of all of the cumulative impacts associated with the Master Plan. The following subsections provide detailed discussion of cumulative impacts by resource topic, and where appropriate, a description of the mitigation measures that would avoid or lessen the cumulative impacts.

**TABLE 6-2**
SUMMARY OF MASTER PLAN’S CONTRIBUTION TO CUMULATIVE IMPACTS

<table>
<thead>
<tr>
<th>Impact</th>
<th>Significance Determination for Project's Contribution to Cumulative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-LU-1: Cumulative impacts related to land use, agricultural resources, and recreational resources.</td>
<td>LCC</td>
</tr>
<tr>
<td>C-TR-1: Cumulative impacts related to transportation.</td>
<td>LCC</td>
</tr>
<tr>
<td>C-NOI-1: Cumulative impacts related to noise.</td>
<td>LCC</td>
</tr>
<tr>
<td>C-AQ-1 Cumulative impacts related to air quality</td>
<td>SU</td>
</tr>
<tr>
<td>C-GHG-1: Cumulative impacts on GHG emissions.</td>
<td>LCC</td>
</tr>
<tr>
<td>C-BIO-1: Cumulative impacts on biological resources: movement routes and migration corridors.</td>
<td>SU</td>
</tr>
<tr>
<td>C-GEO-1: Cumulative impacts on geology, soils, seismicity, and mineral resources.</td>
<td>LCC</td>
</tr>
<tr>
<td>C-HYD-1: Cumulative impacts to hydrology</td>
<td>LCC</td>
</tr>
<tr>
<td>C-WQ-1: Cumulative impacts to water quality</td>
<td>LCC</td>
</tr>
<tr>
<td>C-HAZ-1: Cumulative impacts related to hazards</td>
<td>LCC</td>
</tr>
<tr>
<td>C-PS-1: Cumulative impacts on public services and facilities.</td>
<td>LCC</td>
</tr>
<tr>
<td>C-UT-1: Cumulative impacts on utilities and service systems.</td>
<td>LCC</td>
</tr>
<tr>
<td>C-CUL-1: Cumulative impacts on Cultural and Paleontological Resources.</td>
<td>LCC</td>
</tr>
<tr>
<td>C-AES-1: Cumulative impacts on aesthetic resources.</td>
<td>LCC</td>
</tr>
<tr>
<td>C-ENER-1: Cumulative impacts related to energy use.</td>
<td>LCC</td>
</tr>
</tbody>
</table>

LCC = Project’s contribution to cumulative impact is Less than Cumulatively Considerable
SU = Project’s contribution is cumulatively considerable and impact is Significant and Unavoidable

6.2.1 Land Use and Recreation

Impact C-LU-1: Implementation of the Master Plan and WPF, in combination with other projects, could result in cumulative impacts related to land use, agricultural resources, and recreational resources. Less than Significant.

The geographic scope for potential cumulative impacts related to land use and agricultural and recreational resources encompasses the land uses in the Master Plan vicinity.
6. Cumulative Impacts

Consistency with Local Plans and Policies

There is no cumulative context regarding consistency with local plans and policies because each project proposed within the jurisdiction of local plans is subject to planning, environmental review and permit processes. Through these processes, inconsistencies with applicable plans and policies are resolved prior to implementation. Therefore, this particular issue does not apply in the cumulative context.

Impacts on Agricultural Resources

Cumulative impacts on agricultural resources could result if the Master Plan in combination with other cumulative projects were to: cause the permanent conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use; conflict with existing zoning for agricultural use or Williamson Act contracts; or involve other changes resulting in the conversion of farmland to non-agricultural use. As discussed in Section 4.2.3.2, Approach to Analysis, neither the Master Plan nor the WPF would result in the conversion of designated farmland to non-agricultural use or conflict with agricultural zoning or Williamson Act contracts. Further, proposed future General Plan land use designations and future zoning designations of lands surrounding the WPCP operational area would not result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, the Master Plan’s contribution to potential cumulative impacts on agricultural resources would be less than cumulatively considerable (less than significant).

Impacts on Recreational Resources

As discussed under Impact LU-2 and WPF-LU-2 in Section 4.2, construction of the proposed Master Plan and WPF components could affect use of existing recreational facilities in the area. The construction of these facilities, in combination with any other projects proposed nearby, may cause some recreationists to avoid recreational facilities located near project construction sites, temporarily increasing the use of other local or regional recreation facilities in the project construction vicinity. However, because there are numerous other parks, trails and other recreational resources that are available throughout the Master Plan and WPF area, the temporary increase in use of other local or regional recreation resources that may be attributable to the construction of the Master Plan and WPF facilities would not substantially deteriorate or degrade existing recreational resources. Therefore, the Master Plan’s contribution to potential cumulative impacts to recreational resources would be less than cumulatively considerable (less than significant).

Mitigation Measures: No additional mitigation required.
6.2.2 Transportation

Impact C-TR-1: Implementation of the Master Plan and WPF, in combination with other projects, could result in cumulative impacts related to transportation. Less than Significant with Mitigation.

The geographic scope for potential cumulative impacts related to transportation and circulation encompasses roadways in the Master Plan vicinity. Table 6-1 identifies those projects and other known actions or activities that are located or would occur within the cumulative analysis impacts area. The majority of projects listed in the table have been or would be required to undergo independent environmental review under CEQA. Each project listed in the table would have its own implementation schedule, which may or may not coincide or overlap with the schedule for the Master Plan improvements. However, to be conservative, the cumulative traffic analysis assumes that the majority, if not all, of the projects in the cumulative scenario are built and operating during the operating lifetime of the Master Plan.

Cumulative impacts would be greatest if the peak construction period of most of these projects overlapped. Although this worst-case scenario is unlikely, even if it were to occur, it is unlikely that traffic conditions of the affected regional and local public roadways would degrade to unacceptable service levels because, as discussed for the Master Plan and WPF in Section 4.3 under Impacts TR-1 and WPF-TR-1, most projects have traffic control plans that stipulate that truck traffic should occur outside of the peak commute periods.

Cumulative impacts to segments of SR 237 and other affected roadways (e.g., Caribbean Drive) have been considered because it is likely that construction vehicle trips (workers and trucks) from foreseeable future projects and from WPCP improvements associated with the Master Plan or WPF at the WPCP could occur concurrently, and could traverse the same affected roadway segments as the Master Plan or WPF construction-related traffic, which could result in an adverse cumulative impact on these regional roadways.

In a worst-case scenario, where construction peak periods overlap for most of the projects proposed in the area, traffic congestion (levels of service) along these roadways could be adversely affected due to the temporary influx of construction-related traffic, but likely would not be degraded below acceptable conditions, and would not result in any permanent degradation. Roadways in this area generally have two or more lanes in each direction, which would accommodate the anticipated increase in traffic while maintaining adequate traffic flow. Consequently, even a worst-case scenario likely would not exceed the capacity of these roadways. With respect to the WPF groundwater replenishment facilities, the location of pipeline construction has not been identified to date. Construction of other planned projects in the vicinity during the same time period could cause a cumulative impact; however, as noted above, most projects would have traffic control plans similar to those described in Section 4.3 for the Master Plan and WPF, which would reduce the potential cumulative impact.

Because the exact extent of construction traffic overlap is unknown at this time, it is possible that service levels along affected roadways could be temporarily degraded. Therefore, implementation
of Mitigation Measure C-TR-1, Implement Coordinated Transportation Management Plan, is recommended to reduce the Master Plan’s or WPF’s contribution to potential traffic impacts to the surrounding network. Through implementation of Mitigation Measure C-TR-1, the Master Plan’s or WPF’s contribution to potential cumulative construction traffic impacts would be less than cumulatively considerable (less than significant).

Mitigation Measure C-TR-1: Implement Coordinated Transportation Management Plan.

Prior to construction, the City’s or District’s respective contractor(s) shall develop a Coordinated Transportation Management Plan, and the City/District and its contractor(s) shall work with other projects’ contractors and appropriate County and/or City departments (e.g., Emergency Services, Fire, Police, Transportation) to prepare and implement a transportation management plan for roadways adjacent to and directly affected by the Master Plan improvements or the WPF, and to address the transportation impact of the overlapping construction projects within the vicinity of the Master Plan or the WPF in the region. The transportation management plan shall include, but not be limited to, the following requirements:

- Coordination of individual traffic control plans for the Master Plan or WPF with nearby projects.
- Coordination between the contractor and other project contractors in developing circulation and detour plans that include safety features (e.g., signage and flaggers). The circulation and detour plans shall address:
  - Full and partial roadways closures
  - Circulation and detour plans to include the use of signage and flagging to guide vehicles through and/or around the construction zone, as well as any temporary traffic control devices
  - Bicycle/Pedestrian detour plans, where applicable
  - Parking along public roadways
  - Haul routes for construction trucks and staging areas for instances when multiple trucks arrive at the work sites
- Protocols for updating the transportation management plan to account for delays or changes in the schedules of individual projects.

6.2.3 Noise

Impact C-NOI-1: Implementation of the Master Plan and WPF, in combination with other projects, could result in cumulative impacts related to noise. Less than Significant.

Cumulative Noise Impacts Associated with Project Construction

As discussed under Impacts NOI-1 and WPF-NOI-1, since residential uses are located more than 4,000 feet from the proposed WPCP improvement sites, construction of the Master Plan improvements and the WPF at the WPCP would not be expected to exceed existing ambient noise levels at these residences; similarly, construction noise at the WPCP would not be expected to
contribute considerably to cumulative noise levels at these residences. **Mitigation Measures NOI-1 and WPF-NOI-1a (Develop and Implement Construction Noise Logistics Plan)** would ensure that the noise impact of construction-related truck trips would be less than significant to residential uses along haul routes and is also expected to reduce the Master Plan’s contribution to a potential cumulative noise impact along haul routes to less than cumulatively considerable. Construction of WPF injection wells and associated pipelines may include construction activities adjacent to noise-sensitive uses. No specific sites have been identified for the injection wells or pipelines; consequently, the potential for significant cumulative noise impacts to occur in association with construction of these components cannot be assessed at this time and must be addressed in project-specific CEQA documentation on those facilities.

**Cumulative Operational Noise Exposure in the Project Vicinity**

**Master Plan Improvements and WPF at the WPCP**

As discussed for Impacts NOI-3 and WPF-NOI-3, noise increases associated with the operation of the Master Plan improvements and the WPF at the WPCP would be minimal and mitigation for the WPF injection wells requires compliance with local noise ordinances. The geographic scope for cumulative operational noise impacts of the Master Plan and WPF at the WPCP would include projects within approximately 1,000 feet of the WPCP site. Beyond 1,000 feet, the contributions of noise from other projects would be greatly attenuated through both distance and intervening structures and their contribution would be expected to be minimal. None of the projects from Table 6-1 would be within this distance of the WPCP and generate noise during WPCP operation; thus, there would be no cumulative noise impact resulting from operation of Master Plan improvements or the WPF at the WPCP.

**Pipelines, Injection Wells, and Recharge Basins**

Implementation of **Mitigation Measure WPF-NOI-3** would reduce any impacts from injection well operations to a less-than-significant level. Other projects in the WPF area could generate significant operational noise at noise-sensitive receivers. As described above, no specific sites have been identified for the injection wells or pipelines; consequently, the potential for significant cumulative noise impacts to occur in association with operation of these components cannot be assessed at this time and must be addressed in project-specific CEQA documentation on those facilities.

**Cumulative Vibration Exposure in the Project Vicinity**

**Master Plan Improvements and WPF at the WPCP**

Vibration levels dissipate rapidly from the source; therefore, a cumulative effect could only occur if two vibration sources occur simultaneously in the immediate vicinity of the same receptor. Construction of other cumulative projects in the area during the Master Planning Period (to 2035) could also generate vibrations that, together with the Master Plan improvements or WPF at the WPCP, could be excessive. The City would potentially construct multiple projects concurrently at the WPCP site during the Master Planning Period. Given the spacing of the WPCP projects, the
combined peak particle velocity (PPV) at 200 feet (the distance to the nearest receptor) would be well below the threshold value of 0.20 in/second. Thus, the cumulative impact of vibration during construction would be less than significant.

Mitigation Measures: No additional mitigation required.

6.2.4 Air Quality

Impact C-AQ-1: Implementation of the Master Plan and WPF would have a considerable contribution to cumulative air quality impacts in the region. Significant and Unavoidable.

Criteria Air Pollutants and Conflict with Air Quality Plan

The geographic scope for the assessment of the project’s contribution to cumulative impacts associated with criteria air pollutants is the San Francisco Air Basin. Based on BAAQMD guidance, if a project in the San Francisco Air Basin would result in an increase in emissions of ROG, NOX, PM10, or PM2.5 of more than the respective average daily mass emissions significance thresholds, then it would also contribute considerably to a significant cumulative impact. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project’s individual emissions would be cumulatively considerable. If a project would exceed the identified significance thresholds, its emissions would be cumulatively considerable, and if a project would not exceed the significance thresholds, its emissions would not be cumulatively considerable.

For most Master Plan and WPF stages, short term emissions associated with construction of the Master Plan or WPF would be reduced to a less-than-significant level with implementation of Mitigation Measures AQ-2a and AQ-2b and WPF-AQ-2a and WPF-AQ-2b, respectively. However, insufficient information is currently available about the nature of construction activities associated with Stages 1A and 4A of the Master Plan and Stages 1A and 2E of the WPF, and emissions of criteria pollutants during construction of these stages could be significant even with the aforementioned mitigation (see Impact discussions under AQ-2 and WPF-AQ-2). Therefore, the Master Plan’s or WPF’s construction emissions would be cumulatively considerable, and would result in a significant cumulative impact.

The exceedance of emissions thresholds for criteria pollutants during construction of the Master Plan or WPF would conflict with the 2010 Clean Air Plan, a significant unavoidable impact (as discussed under Impact AQ-1 and WPF-AQ-1). Therefore Master Plan or WPF construction would also contribute considerably to a cumulative impact associated with conflict with an air quality plan, and would result in a significant cumulative impact.

The operational impacts of both the Master Plan and the WPF would be less than significant, as operational emissions would be lower than the BAAQMD thresholds. Operational emissions under the Master Plan or the WPF would therefore not be significant and would not have a cumulatively considerable contribution to a cumulative impact.
**Toxic Air Contaminants**

The geographic scope for the assessment of the contribution of the Master Plan and the WPF to a cumulative impact associated with toxic air contaminants (TACs) is a radius of 1,000 feet from the WPCP. Construction of other cumulative projects in the vicinity of the WPCP as identified in Table 6-1 could occur at the same time and increase exposure for nearby receptors. However, there are no sensitive receptors within 1,000 feet of the WPCP; construction activities associated with Master Plan and the WPF at the WPCP would occur more than 4,000 feet from the nearest sensitive receptors. Therefore, the contribution of the Master Plan and the WPF at the WPCP to a cumulative toxics impact would be less than cumulatively considerable and less than significant.

Construction of the offsite Groundwater Replenishment Facilities under the WPF could coincide with construction of other cumulative projects in their vicinity. As discussed under Impact WPF-AQ-4, the duration of exposure of construction emissions to sensitive receptors within 1,000 feet of the proposed improvements would be short term and associated health risks would be negligible. In addition, implementation of Mitigation Measure WPF-AQ-2b (Implement BAAQMD Additional Construction Mitigation Measures) (identified in Impact WPF-AQ-2 to reduce the impact of criteria pollutants) would further reduce potential exposure of sensitive receptors to TACs. Therefore, the contribution of Groundwater Replenishment Facilities construction to a cumulative health risk impact would not be cumulatively considerable.

Regarding long-term operations of the improvements, the new gas combustion engines at the cogeneration facility proposed both under the Master Plan and the WPF would replace existing older engines of similar capacity. Gas combustion is not a significant source of toxic emissions; therefore, the contribution to a cumulative health risk would be less than significant. The emergency standby generator uses diesel fuel but would be evaluated for health risk impacts as required by the BAAQMD’s permitting process. Therefore, emissions from the standby generator would also not contribute to a significant cumulative impact. These improvements within the WPCP would be located more than three quarters of a mile from the nearest receptors. Lastly, an increase of only approximately four heavy haul truck trips is anticipated to occur daily at the WPCP. Given the distance from these point sources to the nearest residences, and the low amount of daily haul truck trips, the Master Plan and WPF’s contributions to cumulative health risk to offsite sensitive receptors in the project vicinity would be less than significant. Therefore, operation the Master Plan improvements and the WPF would not result in a cumulatively considerable increase to health risk and the cumulative impact would be less than significant.

**Odors**

The geographic scope for potential cumulative odor impacts is a 2-mile radius from the WPCP, in accordance with the BAAQMD odor criteria for wastewater treatment plants. Cumulative odor impacts could result if the WPCP and other odor-producing cumulative projects within 2 miles of the WPCP were to adversely affect odor conditions in the neighborhoods in the vicinity of the WPCP. The SMaRT Station® adjacent to the WPCP is another odor source that affects the project area. As discussed under Impacts AQ-5 and WPF-AQ-5, the BAAQMD considers an existing odor source to have a substantial number of odor complaints and an associated significant odor
impact if the complaint history for the facility includes five or more confirmed complaints per year averaged over a 3-year period. Since the BAAQMD has confirmed that there have been no confirmed odor complaints over the past 3 years (BAAQMD, 2015b), the WPCP’s odor impact to offsite receptors is less than significant.

As discussed under Impacts AQ-5 and WPF-AQ-5, the process changes proposed as part of the Master Plan and the WPF would reduce the potential for odor impacts relative to existing conditions. This is because many of the processes handling odorous material (such as the biosolids handling facilities, thickening and dewatering facilities would be enclosed within structures. Both the Master Plan and the WPF would include a bioscrubber system to treat odors from the solids handling facilities. These features of the improvements under both the Master Plan and the WPF would reduce the odor impact from the WPCP to less than existing levels. Therefore, the contribution to a cumulative odor impact would be less than significant.

**Mitigation Measures:** No additional mitigation required.

### 6.2.5 Greenhouse Gas Emissions

**Impact C-GHG-1: Implementation of the Master Plan and WPF, in combination with other projects, could result in cumulative impacts on GHG emissions. Less than Significant.**

Both the Bay Area Air Quality Management District (BAAQMD) and the California Air Pollution Control Officers Association (CAPCOA) consider GHG emissions impacts to be exclusively cumulative impacts (BAAQMD, 2011; CAPCOA, 2008); as such, assessment of significance is based on a determination of whether the GHG emissions from a project represent a cumulatively considerable contribution to the global atmosphere. WPCP improvements under the Master Plan would result in an amortized net increase of approximately 2,605 metric tons of carbon dioxide equivalent (CO₂e) per year and the WPF would result in an amortized net increase of approximately 7,141 metric tons CO₂e per year. More important, both the Master Plan and the WPF would be consistent with the goals in the Sunnyvale Climate Action Plan and the state’s AB 32 GHG reduction goals and would not be considered to hinder the region’s progress towards reducing impacts of climate change. Therefore, the project’s contribution to GHG impacts would be less than cumulatively considerable, and cumulative impact associated with the project would be less than significant.

**Mitigation Measures:** No additional mitigation required.

### 6.2.6 Biological Resources

**Impact C-BIO-1: Implementation of the Master Plan and WPF, in combination with other projects, would have a potentially significant contribution to cumulative impacts on biological resources. Significant and unavoidable.**

This assessment of cumulative impacts on biological resources includes past, present, and reasonably foreseeable future projects and activities near the Master Plan and WPF planning areas
that potentially could contribute to significant cumulative impacts (refer to Table 6-1). Projects that are relevant to the cumulative biological resource impact analysis include those that could contribute incremental effects on the same biological resources and would have similar impacts as those discussed in Sections 4.7.3.4 and 4.7.3.5 of this PEIR, and that occur in the general South San Francisco Bay/ northern Santa Clara Valley region. The projects that have been determined to have substantial impacts, in terms of the magnitude of impacts, similar to those of the Master Plan and WPF, in terms of the types of biological resources impacted, are discussed below for each sensitive biological resource topic. The projects listed in Table 6-1 are subject to independent environmental review and consideration by approving agencies; therefore, it is possible that some of these reasonably foreseeable future projects would not be approved or would be modified prior to approval (e.g., as a result of CEQA). For the purposes of assessing worst-case cumulative impacts on biological resources, this analysis is premised on the approval and construction of all relevant and reasonably foreseeable future projects.

**Impacts on Special-Status Plants**

As described in Section 4.7 under Impacts BIO-1 and WPF-BIO-1, both the Master Plan and the WPF Project could potentially impact Congdon’s tarplant. Other cumulative projects considered could potentially impact this species, including the Sunnyvale East and West Channels Flood Protection Project, the South Bay Salt Ponds Restoration Project, the District’s Stream Maintenance Program, the Sunnyvale Land Use and Transportation Element Update, and the San José/Santa Clara Regional Wastewater Facility Master Plan. These projects, in combination with the Master Plan and WPF activities, could have a potentially significant cumulative impact on Congdon’s tarplant.

The Master Plan and WPF would implement Mitigation Measures BIO-1a and WPF-BIO-1a (Reduce Impacts on Congdon’s Tarplant) and BIO-1b and WPF-BIO-1b (Prevent the Introduction and Spread of Non-native, Invasive Species) to reduce impacts of implementation of the Master Plan or WPF on Congdon’s tarplant to less-than-significant levels. Implementation of these measures would also ensure that the contribution of either the Master Plan or WPF to cumulative impacts on special-status plant species would be less than cumulatively considerable.

**Impacts on Special-Status Animals**

Impacts BIO-2 and WPF-BIO-2 in Section 4.7 discuss impacts of the Master Plan and WPF activities on special-status animals and conclude that, with implementation of mitigation measures the Master Plan and WPF would have a less-than-significant impact on special-status animals. In addition, implementation of mitigation measures for impacts on wetland, aquatic, and riparian habitats and on ordinance-sized trees would confer some benefit to special-status animals.

Cumulative impacts on special-status animal species would result primarily from modification and loss of habitat for these species. Several projects considered in this analysis have the potential to adversely affect individuals of these wildlife species as well, although in many cases, mitigation measures to avoid and minimize such impacts on individuals are incorporated into the projects, so that the residual impacts are mostly habitat-related. The projects that would result in the greatest
amount of cumulative modification or loss of habitat for the special-status animal species affected by the Master Plan or the WPF are: Sunnyvale East and West Channels Flood Protection Project; South San Francisco Bay Shoreline Study; South Bay Salt Pond Restoration Project; California High Speed Rail; the District’s Stream Maintenance Program; Sunnyvale Land Use and Transportation Element Update; and San José/Santa Clara Regional Wastewater Facility Master Plan.

These projects are located within the South San Francisco Bay Area and are proposed to occur during the same general period as the Master Plan or WPF. These projects would collectively result in impacts to many of the same special-status animal species, as well as modification and loss of their habitats, that would be affected by the Master Plan or WPF. These impacts would cause a reduction in populations of special-status species within the region, both due to impacts to individuals and habitat modifications. Therefore, this cumulative impact on special-status animal species would be potentially significant. However, many of these projects also include substantial restoration of habitat for special-status species, such as the South Bay Salt Ponds Restoration Project and the Shoreline Study. In addition, a large portion of the Master Plan area that is currently managed as non-tidal oxidation ponds would be restored to more natural tidal marsh or freshwater marsh habitats, thus providing a net benefit to a number of special-status animal species that occur within tidal salt marsh and tidal brackish marsh, or non-tidal freshwater marsh habitats. Implementation of Mitigation Measures BIO-2a through 2h (Worker Environmental Awareness Training, Minimization of Impacts on Water Quality, Special-Status Fish Measures, Western Pond Turtle Measures, Burrowing Owl Measures, California Ridgway’s Rail and California Black Rail Measures, Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew Measures, and Nesting Bird Measures) or WPF-BIO-2a (Worker Environmental Awareness Training), WPF-BIO-2b (Burrowing Owl Measures), WPF-BIO-2c (Western Pond Turtle Measures), WPF-BIO-2d (Nesting Bird Measures), and WPF-WQ-4 (Water Quality Evaluation and Control Plan for Oxidation Pond Breaching and Restoration) would ensure that the contribution of either the Master Plan or WPF to cumulative impacts on special-status wildlife species would be less than cumulatively considerable.

Impacts on Wetlands and Aquatic Habitats

Impacts BIO-3 and WPF-BIO-3 in Section 4.7 discuss impacts of the Master Plan and WPF activities on jurisdictional wetlands and aquatic habitats and conclude that, with implementation of mitigation measures the Master Plan and WPF would have a less-than-significant impact on these habitats.

Cumulative impacts on jurisdictional wetlands and aquatic habitats would result from a number of other projects in the region as well. The cumulative projects that would result in the greatest extent of impacts on these habitats are: Sunnyvale East and West Channels Flood Protection Project; South San Francisco Bay Shoreline Study; South Bay Salt Pond Restoration Project; the District’s Stream Maintenance Program; and San José/Santa Clara Regional Wastewater Facility Master Plan.

In combination, the Master Plan or the WPF and these other projects could have a potentially significant cumulative impact on jurisdictional wetlands and aquatic habitats. However, all such projects are expected to obtain (or have already obtained) permits from the USACE, RWQCB,
BCDC, and CDFW for impacts on jurisdictional wetlands and aquatic habitats, and such permits (in addition to CEQA mitigation measures) require compensatory mitigation for impacts on such habitats. In addition, several of these projects, such as the South Bay Salt Ponds Restoration Project and the Shoreline Study, would restore extensive areas of tidal habitat and improve the quality of wetlands and aquatic habitat in the region. Further, the Master Plan and WPF would implement mitigation measures to reduce the project impacts on jurisdictional wetlands and aquatic habitats to less-than-significant levels. Implementation of these measures would also ensure that the contribution of either the Master Plan or WPF to cumulative impacts on jurisdictional wetlands and aquatic habitats would be less than cumulatively considerable.

**Impacts on Riparian Habitats**

Impact WPF-BIO-8 in Section 4.7 discusses potential impacts of the WPF activities on riparian habitats and concludes that, with implementation of mitigation measures, the WPF would have a less-than-significant impact on these habitats. The Master Plan would have no impact on riparian habitats, as these habitats do not occur within the planning area boundaries.

Cumulative impacts on riparian habitats would potentially result from a number of other projects in the region as well. The cumulative projects that would result in the greatest extent of impacts on these habitats are: Sunnyvale East and West Channels Flood Protection Project; California High Speed Rail; the District’s Stream Maintenance Program; and Sunnyvale Land Use and Transportation Element Update.

In combination, the WPF and these other projects could have a potentially significant cumulative impact on riparian habitats in the region. However, all such projects are expected to obtain (or have already obtained) permits from the California Department of Fish and Wildlife (CDFW) for impacts on riparian habitats, and such permits (in addition to CEQA mitigation measures) require or would require compensatory mitigation for impacts on such habitats.

The WPF would implement mitigation measures for any impacts on riparian habitat to reduce potential impacts on riparian habitats to less-than-significant levels. Implementation of these measures would also ensure that the contribution of the WPF to a cumulative impact on riparian habitats in the region would be less than cumulatively considerable. Because the Master Plan would have no impact on riparian habitats in the region it would not contribute to a cumulative impact.

**Impacts on Protected Trees**

Impacts BIO-4 and WPF-BIO-4 in Section 4.7 discuss impacts of the Master Plan and WPF on trees protected by the ordinances of the cities in which these activities would occur. These impact discussions conclude that, with implementation of mitigation measures, the Master Plan and WPF would have a less-than-significant impact on protected trees.

Cumulative impacts on protected trees would potentially result from a number of other projects in the region as well. The cumulative projects that would result in the greatest extent of impacts
on trees are: Sunnyvale East and West Channels Flood Protection Project; California High Speed Rail; the District’s Stream Maintenance Program; Sunnyvale WPCP Primary Treatment Facility; and San José/Santa Clara Regional Wastewater Facility Master Plan.

The Master Plan or WPF in combination with these other projects could have a potentially significant cumulative impact on protected trees. However, the vast majority of such projects are expected to obtain (or have already obtained) permits (or other regulatory mechanisms) from the respective municipalities for impacts on protected trees, and such permits (in addition to CEQA mitigation measures for many projects) require compensatory mitigation for impacts to protected trees. With implementation of these compensatory mitigation measures, the cumulative impact on protected trees is expected to be less than significant. In addition, the Master Plan and WPF would implement Mitigation Measures BIO-4a and WPF-BIO-4a (Avoidance and Preservation of Trees), BIO-4b (Master Plan Compensation for Impacts on Protected Trees) for impacts on trees in Sunnyvale, and the WPF would implement WPF-BIO-4c (WPF Mitigation for Impacts on Protected Trees) for impacts on trees in WPF areas outside Sunnyvale, to reduce the potential Master Plan and WPF impacts on protected trees to less-than-significant levels. Implementation of these measures would also ensure that the contribution of either the Master Plan or WPF to cumulative impacts on protected trees would be less than cumulatively considerable.

**Impacts on Migration Routes and Movement Corridors**

Impacts BIO-5 and WPF-BIO-5 in Section 4.7 discuss potential impacts of the Master Plan and WPF activities on movement of animals. These impact discussions include potential impacts and beneficial effects of the Master Plan on habitat used by migratory birds, especially at Ponds 1 and 2, and potential WPF impacts from temporary construction activities across creeks during installation of the WPF pipelines. These discussions conclude that the Master Plan and WPF would each have a less-than-significant impact on migration routes and movement corridors.

Cumulative impacts on migration routes and movement corridors, particularly impacts on migratory birds, would result from a number of other projects in the region. The cumulative projects that would result in the greatest extent of impacts on these biological resources are: Santa Clara Valley Habitat Conservation Plan; South Bay Salt Pond Restoration Project; South San Francisco Bay Shoreline Study; the District’s Stream Maintenance Program; and San José/Santa Clara Regional Wastewater Facility Master Plan.

The Master Plan or WPF in combination with these other projects could have a potentially significant cumulative impact on migration routes. In particular, projects occurring along the San Francisco Bay shoreline could disrupt use of wetland habitats by resident and migratory waterbirds. Many of these projects include substantial restoration of habitat for migratory species, such as the South Bay Salt Ponds Restoration Project and the Shoreline Study, and a large portion of the Master Plan area that is currently managed as non-tidal ponds would be restored to more natural tidal marsh or freshwater marsh habitats, thus providing a net benefit to a number of species that occur within tidal salt marsh and tidal brackish marsh, or non-tidal freshwater marsh habitats, in the region.
The South Bay Salt Ponds Restoration Project and Shoreline Study would result in impacts to birds that use managed ponds, including many of the same species that currently use Ponds 1 and 2, as more of those ponds are restored to tidal habitat. Both of those projects include intensive monitoring throughout the South Bay (not only in South Bay Salt Ponds Restoration Project/Shoreline Study project areas) to determine whether regional abundance of pond-associated birds is declining unacceptably. In addition, these projects include adaptive management measures, such as more intensive pond management specifically focusing on declining pond-associated species, or curtailing the conversion of managed ponds to tidal habitats to maintain necessary habitat for pond-associated birds. As a result, regional abundance of most pond-associated species as a result of the South Bay Salt Ponds Restoration Project and Shoreline Study, in combination with the Master Plan or WPF at the WPCP is not expected to decline to the point of a significant impact as a result of the loss of managed pond habitat.

However, the South Bay Salt Ponds Restoration Project concluded that impacts to one species, the ruddy duck (*Oxyura jamaicensis*), from that project would be significant and unavoidable. The ruddy duck breeds in limited numbers in ponds and non-tidal marshes throughout the South Bay, but the majority of individuals occur here as nonbreeders during migration and winter, when thousands occur on managed ponds around the Bay. Because this species occurs in the South Bay almost exclusively in managed pond habitats, making little use of tidal habitats, tidal restoration at the scale implemented by the South Bay Salt Ponds Restoration Project (and facilitated by the Shoreline Study) would not be feasible while maintaining sufficient habitat for maintenance of South Bay wintering ruddy duck numbers. As a result, impacts to ruddy ducks from the South Bay Salt Ponds Restoration Project were considered significant and unavoidable.

Ruddy ducks often roost and forage on Pond 2 (and to a lesser extent on Pond 1) of the Sunnyvale WPCP. During the nonbreeding season, counts of hundreds of individuals are not unusual, and the maximum count of Ruddy Ducks at the Sunnyvale WPCP was of 2,950 birds on 20 December 1996 (Santa Clara County Bird Data, unpublished). The number of individuals using Ponds 1 and 2 represents a small proportion of the number of ruddy ducks using managed ponds within the South Bay Salt Ponds Restoration Project and other managed ponds in the South Bay, and therefore, if Ponds 1 and 2 are converted to tidal habitats, impacts on ruddy ducks from Master Plan activities would be small relative to changes that occur as a result of, and that are monitored by, the South Bay Salt Ponds Restoration Project and Shoreline Study. Nevertheless, if Ponds 1 and 2 are not maintained and managed for waterfowl such as ruddy ducks, their conversion to other habitat types under the Master Plan or WPF would result in a cumulatively considerable contribution to the potentially significant cumulative impact on ruddy ducks. This impact would thus be significant and unavoidable.

**Impacts on Wildlife Nursery Areas**

Impacts BIO-6 and WPF-BIO-7 in Section 4.7 discuss potential impacts of the Master Plan and WPF activities on nursery areas, such as areas providing habitat for nesting birds and roosting bats. These discussions conclude that with implementation of mitigation measures the Master Plan and WPF would have a less-than-significant impact on nesting birds and roosting bats.
Cumulative impacts on nursery areas for animals such as bats and birds would result from a number of other projects in the region. The cumulative projects that would result in the greatest extent of impacts on these biological resources are: Sunnyvale East and West Channels Flood Protection Project; South Bay Salt Pond Restoration Project; South San Francisco Bay Shoreline Study; the District’s Stream Maintenance Program; and San José/Santa Clara Regional Wastewater Facility Master Plan.

In combination, the Master Plan or the WPF and these other projects could have a potentially significant cumulative impact on nursery areas for native wildlife species, such as bats and birds. Projects that would disturb trees, vegetation, bridges, and crossing structures, or disrupt wildlife use of these nesting and roosting substrates, could affect large numbers of nesting birds and roosting bats. These considerable cumulative impacts would be significant in the absence of mitigation and conservation measures. However, many of these projects would implement (and possibly be required to implement, as a condition of the Santa Clara Valley Habitat Plan [Habitat Plan], CEQA approvals, and/or agency permits) measures to avoid and minimize impacts to nesting birds and roosting bats. In addition, some projects such as the Habitat Plan would implement conservation measures that are expected to result in a net benefit to many breeding bird and bat species, and projects resulting in extensive tidal habitat restoration, such as the South Bay Salt Ponds Restoration Project and Shoreline Study, would have a substantial net benefit on breeding habitat for tidal marsh-associated animals. Therefore, cumulative impacts on nesting birds and roosting bats are less-than-significant.

**Mitigation Measure BIO-2h and WPF-BIO-2d (Nesting Bird Measures)** would be implemented for Master Plan activities, and for WPF activities near bridges and overpasses, to reduce or avoid potential impacts on nesting birds. WPF activities within the Habitat Plan area would be required to implement measures to avoid impacts to protected birds per Habitat Plan Condition 1 (Avoid Direct Impacts on Legally Protected Plant and Wildlife Species). **Mitigation Measure WPF-BIO-7 (Roosting Bat Measures)** would be implemented to reduce impacts of WPF pipeline construction around bridges and overpasses on roosting bats. Implementation of these measures would ensure that the contribution of either the Master Plan or WPF to cumulative impacts on nesting birds and roosting bats would be less than cumulatively considerable.

**Impacts from Conflict with an Adopted Habitat Conservation Plan, Natural Community Conservation Plan, or Other Approved Local, Regional, or State Habitat Conservation Plan**

Impact WPF-BIO-9 in Section 4.7 discussed impacts of the WPF activities resulting from potential conflicts with the Habitat Plan, which is the only applicable adopted habitat conservation plan or natural community conservation plan. This impact discussion concludes that, with implementation of **Mitigation Measure WPF-BIO-9:(Santa Clara Valley Habitat Conservation Plan Compliance)** the WPF would have a less-than-significant impact resulting from such conflicts.
Although several habitat conservation plans exist in the general region, the Habitat Plan is by far the largest adopted plan and the only plan that overlaps with the WPF groundwater replenishment facilities area; the Habitat Plan does not overlap with the Master Plan area. The Habitat Plan requires covered activities to comply with its conditions. Lead agencies that are Habitat Plan partners ensure that all projects in the plan area comply with the Habitat Plan, and the Santa Clara Valley Habitat Agency carries out implementation of the Habitat Plan's conservation program, monitors covered impacts, and otherwise oversees Habitat Plan compliance. As a result, cumulative impacts resulting from other projects’ potential conflicts with the Habitat Plan are less than significant, because covered projects are required to comply.

The District would implement Mitigation Measure WPF-BIO-9 (Santa Clara Valley Habitat Conservation Plan Compliance) for the WPF to avoid any potential conflicts with the Habitat Plan. Implementation of this measure would ensure that the WPF’s contribution to cumulative impacts resulting from potential conflicts with the Habitat Plan would be less than cumulatively considerable. Because the Master Plan would have no impact on compliance with the Habitat Plan, it would not contribute to a potential cumulative impact on the Habitat Plan.

**Conclusion: Significant and Unavoidable.** The Master Plan and WPF would implement mitigation measures to reduce potential effect to less than significant. However, if Ponds 1 and 2 are converted to tidal habitats, the Master Plan would have a potentially significant contribution to the cumulative impact on ruddy ducks, a cumulative impact driven primarily by other, larger projects that affect managed pond habitat in the South Bay. This potentially significant impact to ruddy ducks is unavoidable.

**Mitigation Measures:** No additional mitigation required.

### 6.2.7 Geology and Soils

**Impact C-GEO-1:** Implementation of the Master Plan and WPF, in combination with other projects, could result in cumulative impacts related to geology, soils, seismicity, and mineral resources. Less than Significant.

The entire Bay Area lies within a seismically active region with a wide range of geologic and soil conditions that can vary substantially over a short distance. Thus, the cumulative context for potential impacts to people and structures related to geologic and seismic hazards is more localized or site-specific. Unless a project would alter the rock underlying other adjacent projects or affect surrounding land due to landslides, impacts related to geologic, soils, and seismic hazards would be limited to the project site. The geographic scope of cumulative impacts related to geologic, soils, or seismic hazards therefore includes the WPCP and any projects immediately adjacent to it. The temporal scope includes construction, operation and maintenance phases of the Master Plan or WPF. Projects that would occur adjacent to the WPCP during the construction, operation, or maintenance of the Master Plan or WPF include the Sunnyvale East and West Channels Flood Protection Project and the Sunnyvale Water Pollution Control Plant Primary
Treatment Facility Project, both of which would be subject to the same set of regulations as the Master Plan, which would reduce the potential for cumulative hazards.

As analyzed in Section 4.8, Geology, Soils, Seismicity and Mineral Resources, the Master Plan would have no impacts related to (1) exposure of people or structures to fault rupture or seismically induced landslides, (2) substantial soil erosion or the loss of topsoil, (3) unsuitable soils for septic tanks or alternative wastewater disposal systems, and (4) loss of access to mineral resources. These issues are not considered in the cumulative context because in these cases the Master Plan or WPF would not contribute, even incrementally, to cumulative impacts related to geology, soils, seismicity, and mineral resources. Potential geologic and soils impacts associated with the Master Plan and WPF include damage from exposure of people or facilities to ground shaking, liquefaction ground failure, landfill slope failure, and problematic soils. With mitigation incorporated, construction and operation of the Master Plan or WPF would result in a less-than-significant impact related to geologic hazards at the WPCP. Therefore, since the Master Plan or WPF would be designed in accordance with seismic design criteria as required by the California Building Code (CBC) and with other specific design criteria, including those specified in mitigation, cumulative effects of the Master Plan or WPF projects along with other projects adjacent to the WPCP would be less than significant.

**Mitigation Measures:** No additional mitigation required.

### 6.2.8 Hydrology

**Impact C-HYD-1: Implementation of the Master Plan and WPF, in combination with other projects, could result in cumulative impacts to hydrology. Less than Significant.**

The geographic context for cumulative impacts associated with surface water hydrology is the watershed area contributing to the same receiving waters as the proposed project, as these are the waters that would be affected by sedimentation, surface drainage/topography changes, and pollutant discharges of the proposed project in combination with other projects. The geographic context for cumulative impacts to groundwater includes projects that would affect the same aquifers as the Master Plan or WPF. Projects within the geographic scope for hydrology include the Sunnyvale East and West Channels Flood Protection Project, the Sunnyvale Primary Treatment Facility Project, the South San Francisco Bay Shoreline Study, the City of Sunnyvale Sanitary Sewer Collection System Master Plan, and the District’s Stream Maintenance Program.

**Impacts related to impervious surface area**

Hydrologic and water quality effects of these projects could include sedimentation or non-point source pollution in downstream receiving waters, particularly during the construction phases, or effects on the underlying groundwater aquifer, including paving or otherwise reducing infiltration in recharge areas or degradation of groundwater quality in the event of a contaminant release. In the absence of regulatory controls, the primary cumulative effects of these projects would be to significantly alter the natural hydrology of the watershed through increases in impervious surfaces and to increase the potential for the release of non-point source pollutants.
However, the proposed project, along with other projects occurring in the area, would be required to comply with applicable federal, state, and local water quality regulations. The project along with other projects in the cumulative scenario would be required to comply with the Construction General Permit and/or implement water quality best management practices that effectively control erosion and sedimentation and other construction-related pollutants. Upon completion, projects would also be required to comply with the requirements of the Municipal Regional Stormwater Permit. The conditions of these permits would ensure that construction- and operation-related pollutant loads and stormwater discharges would be minimized to the extent required in order to maintain consistency with the Basin Plan, and to maintain downstream beneficial use. Similarly, it is anticipated that all cumulative projects in the geographic scope would be required to maintain compliance with applicable construction and operation period stormwater discharge requirements, as applicable, as well as implement Stormwater Pollution Prevention Plans (SWPPPs) and adhere to state and local requirements regarding management of stormwater and stormwater quality. Adherence to these requirements would ensure that significant water quality degradation would not occur, and would also protect identified beneficial uses downstream. Therefore, the Master Plan in combination with projects in the vicinity would not result in a significant cumulative impact related to stormwater quality.

**Impacts related to placement of structures within the 100-year flood zone**

The project’s impacts related to the placement of structures at the WPCP, outside of the WPCP, or as part of the WPF that could impede or redirect flood flows are considered less than significant after mitigation. Because there are no properties downstream of the WPCP, these impacts would be site-specific and would not contribute to a cumulative impact. Similarly, the potential exposure of people or structures to loss, injury or death from flooding would also be site-specific to the WPCP. With **Mitigation Measure WPF-HYD-1b (Hydraulic Analyses for Stream Crossings)**, the WPF pipeline stream crossings would be above the 100-year flood zone. Accordingly, no significant cumulative impact would result.

**Impacts to groundwater levels and storage**

While cumulative groundwater withdrawals in the Santa Clara Basin combined with climate conditions have resulted in lowering of groundwater levels, the cumulative impacts of the Master Plan or WPF combined with the other projects in the geographic scope on groundwater levels and storage would be less than significant with some beneficial impacts related to maintaining groundwater levels, improving groundwater storage, and reducing subsidence risk. The Sunnyvale East and West Channels Flood Protection Project, the City of Sunnyvale Sanitary Sewer Collection System Master Plan, and the District’s Stream Maintenance Program could result in additional recharge to the underlying aquifer, as would the WPF, and any construction dewatering for these projects would be temporary. Therefore, the proposed project and the cumulative projects would not contribute to an adverse cumulative impact. Accordingly, no significant cumulative impact would result.

**Mitigation Measures:** No additional mitigation required.
6.2.9 Water Quality

Impact C-WQ-1: Implementation of the Master Plan and WPF, in combination with other projects, could result in cumulative impacts to water quality. Less than Significant.

The geographic scope of potential cumulative impacts on water quality resources encompasses the WPCP, and water bodies downstream of the main plant including Moffett Channel, Guadalupe Slough, and the South San Francisco Bay in the vicinity of the project area. Projects considered within the cumulative analysis include those listed in Table 6-1 that were determined to be relevant to the cumulative analysis of water quality. A review of available documentation for each relevant project was completed in order to identify potential residual impacts associated with cumulative projects that could potentially contribute to a cumulative degradation of water quality in the vicinity of the project area. Potential water quality degradation associated with construction activities is addressed in the cumulative impact discussion for hydrology, above.

Environmental documentation has been completed for the following cumulative scenario projects, as relevant to water quality: Sunnyvale East and West Channels Flood Protection Project, the South Bay Salt Ponds Restoration Project, and the City of San José/Santa Clara Regional Wastewater Facility Master Plan. Only select projects, for instance the San José/Santa Clara Regional Wastewater Facility Master Plan, identified potential water quality impacts to surrounding waterways. However, with implementation of mitigation measures and adherence to regulatory requirements, all potential water quality impacts were minimized, and no outstanding significant impacts were identified. Similarly, no residual impacts that would meaningfully contribute to a cumulative scenario water quality impact were identified.

Environmental documentation for other projects listed in Table 6-1 relevant to water quality has not yet been completed. Based on a review of proposed cumulative scenario actions and facilities, it appears to be likely that once completed, environmental documentation for these other cumulative projects would either not identify any significant or potentially significant water quality impacts, or if potentially significant impacts are identified, they would be minimized via adherence to regulatory discharge/permitting requirements, and implementation of mitigation. Because all project design and construction procedures for these projects are not known, there is potential for a cumulative impact to water quality. For example, dredging or other earth-moving activities in and adjacent to former salt ponds and sloughs could conceivably result in unmitigable releases of chemicals or other impacts on water quality for projects where environmental review has not yet been completed. Therefore, although unlikely, a potentially significant cumulative impact to water quality could occur.

Even if a significant cumulative scenario impact to water quality were to occur, the project would not meaningfully contribute to that impact. As discussed for direct impacts to water quality, effluent from the WPCP outfall would continue to be permitted under the Plant’s existing permit. Permit conditions would continue to reflect state and federal antidegradation policies, ensuring that water quality emissions would not worsen. Permit conditions would also ensure that water release would be of sufficient quality so as to ensure adherence to Basin Plan requirements and the protection of beneficial use. Additionally, because the Master Plan includes various
6. Cumulative Impacts

wastewater treatment plant upgrades aimed to improve water quality, a net benefit to discharged water quality would occur as a result of implementation of the Master Plan. With respect to the WPF, the concentrate management scenarios related to this facility would also be required to adhere to the above identified requirements, and production of highly purified water for groundwater replenishment would be anticipated to have a net benefit with respect to TDS levels. As discussed for direct impacts, adherence to the requirements of these permits and applicable regulations for groundwater replenishment would ensure that water quality of receiving waters and groundwater would be protected, to the extent required to protect beneficial use and in accordance with the SFRWQCB’s Basin Plan. Therefore, implementation of the Master Plan would not meaningfully contribute to any net degradation of water quality effects that could result from the implementation of cumulative scenario projects, and cumulative impacts to water quality would be less than cumulatively considerable and less than significant.

**Mitigation Measures:** No additional mitigation required.

### 6.2.10 Hazards and Hazardous Materials

**Impact C-HAZ-1:** The project could result in cumulatively considerable impacts related to hazards and hazardous materials. Less than significant.

For the analysis of cumulative impacts associated with hazards and hazardous materials, the geographic scope encompasses the WPCP, the conveyance pipelines, the existing recharge basins, and the proposed injection well sites. With respect to hazardous materials in the environment, effects are generally limited to site-specific conditions.

**Increased Use of Hazardous Materials During Operation**

Cumulative impacts related to the use of hazardous materials could occur where projects would increase the use of hazardous materials in the same general area as the Master Plan or WPF. As discussed in Impacts HAZ-1 and WPF HAZ-1 in Section 4.11, Hazards and Hazardous Materials, additional treatment chemicals would be used during project operation. The City of Sunnyvale’s Primary Treatment Facility project identified in Table 6-1 would also increase the routine use, transportation and disposal of hazardous materials at the site. However, both of these projects would include secondary containment and other design features to prevent and contain an accidental release of hazardous materials. Each project would require updating the WPCP’s Hazardous Materials Business Plan to provide for the safe and lawful storage of these materials, worker safety provisions, and emergency procedures. Surface water runoff (which could convey potential leaks or spills) from both of these projects would be contained within the WPCP’s stormwater drainage system and routed for treatment. Accordingly, no cumulative impact would result related to the routine use of hazardous materials during operation of the project and other cumulative projects in the immediate vicinity.
Use of Hazardous Materials for Construction

As discussed in Impacts HAZ-2 and WPF-HAZ-2, accidental spills of small quantities of hazardous materials during construction (i.e., motor fuels, oils, solvents, lubricants) could expose the public or the environment to such substances. The project would be required to adhere to all applicable regulations regarding hazardous materials storage and handling, as well as to implement all construction BMPs to prevent such a release and to promptly contain and clean up any spills. With compliance with existing laws and regulations discussed in Section 4.11.2, the Master Plan’s impact would be less than significant. Construction of cumulative projects in the Master Plan vicinity would also involve the use of hazardous materials and could result in accidental releases of these materials. Although the potential exists for releases to occur in connection with the Master Plan and other cumulative projects, there is no way of predicting whether any such releases would occur. Further, the likelihood that more than one of the cumulative projects would have a substantial hazardous materials release that affects the same area within the same temporal period is low. Therefore, the effects of the Master Plan in combination with those of other planned projects would not result in a significant cumulative hazardous materials impact.

Some of the projects in Table 6-1 may be constructed near existing schools. None of the planned projects is industrial in nature, nor would any of the planned projects emit hazardous materials during operation. Hazardous materials would be used during construction and operation of the Master Plan and other planned projects; however, the combined effects of these projects would not result in a significant cumulative impact related to a release of hazardous materials, including releases that could affect nearby schools, given that none of the projects would use large quantities of hazardous materials and all are required to comply with laws and regulations intended to ensure the safe handling, storage and disposal of hazardous materials.

Hazardous Materials in Soil and Groundwater

Cumulative impacts related to the presence of hazardous materials in the soil could occur if the Master Plan and cumulative projects would be implemented in the same area at the same time. Of the projects listed in Table 6-1, the construction footprints of the Primary Treatment Facility Project, the Oxidation Pond Maintenance, and the Master Plan would overlap geographically with the Sunnyvale East and West Channels Flood Projection Project. These projects would have overlapping construction schedules.

As discussed in Impacts HAZ-2, HAZ-3, WPF-HAZ-2 and WPF-HAZ-3, hazardous materials could be present in project area soil and groundwater. Many of the potentially cumulative projects would also include excavation within areas near known or unknown hazardous materials sites. Therefore, cumulative impacts related to the exposure of workers and the public to hazardous materials in soil during construction of the Master Plan project and other cumulative projects are considered potentially significant.

During construction of the Master Plan, the contractor would be required to implement a Stormwater Pollution Prevention Plan or a Stormwater Control Plan that would specify appropriate methods for storing hazardous materials, preventing spills, inspecting for hazardous conditions, and reporting releases. Because the cumulative projects listed in Table 6-1 would be
subject to similar federal, State, and local requirements as discussed above in Section 4.11.2, they would also be required to implement BMPs for stormwater control that would reduce the potential for leaks and spills of hazardous materials to runoff construction sites into the environment.

Without project-level mitigation, the Master Plan project’s contribution to this impact could be cumulatively considerable. However, as required by Mitigation Measures HAZ-2b (Health and Safety Plan) and HAZ-2c (Soil and Groundwater Management Plan), the project would include a site-specific Health and Safety Plan and a contingency plan that specifies the appropriate procedures for managing soil during construction. Because these measures ensure worker safety provisions are implemented and that any contaminated soils are appropriately managed, the Master Plan’s contribution to cumulative impacts related to the exposure of workers and the public to hazardous materials in the soil would not be cumulatively considerable (less than significant).

**Proximity to an air strip**

The geographic context for a cumulative hazard impact associated with development in the vicinity of an air strip is the area within a two-mile radius around Moffett Federal Airfield. Although the WPCP is located approximately 1.75 miles east of the Moffett Federal Airfield, the WPCP is outside the airport’s noise contour and approach zone, and the Master Plan’s proposed structures would be well below the airport’s height restriction (as discussed under Impact HAZ-4). Therefore the Master Plan’s contribution to a potential cumulative hazard impact related to development in proximity to an airport or airstrip would not be cumulatively considerable and would be less than significant.

**Emergency Response**

Master Plan and WPF construction activities could require temporary partial and/or full lane closures and alternating one-way traffic flow adjacent to the work zone, which could interfere with emergency response and evacuation traffic routes. Construction would occur on Carl Road and Caribbean Drive under the Master Plan and WPF at the WPCP; the location of pipeline construction for the WPF groundwater replenishment facilities is unknown. Construction of other planned projects in the vicinity during the same time period could cause a cumulative impact with respect to emergency response/evacuation routes if these projects were to cause closures of additional roads in the project vicinity that could be used as alternate evacuation routes. Improvement projects for the City of Sunnyvale Sewer System Management Plan could potentially overlap with WPF pipeline construction. It is unlikely that the cumulative impact on emergency response would be significant because, like the project, most projects would have traffic control plans that require coordination with emergency response providers, among other provisions. (Refer to Mitigation Measure TR-1b in Section 4.3, Transportation regarding traffic control plan contents.) In addition, as discussed above in Section 6.2.2, because the exact extent of construction traffic overlap is currently unknown, implementation of Mitigation Measure C-TR-1 (Implement Coordinated Transportation Management Plan) is recommended. Implementation of this measure would ensure that the Master Plan’s contribution to potential cumulative construction traffic impacts, including potential impacts related to emergency access, would be less than cumulatively considerable (less than significant).
Mitigation Measures: No additional mitigation required.

6.2.11 Public Services

Impact C-PS-1: Implementation of the Master Plan and WPF, combined with other projects in the area, could result in cumulative impacts on public services and facilities. Less than Significant.

The geographic scope for cumulative impacts to public services is comprised of the service areas of the fire and police and other public facilities that serve the WPCP or the area surrounding the WPCP. Cumulative impacts on fire and police protection services could be significant if construction or operation of projects in the vicinity of the Master Plan or WPF would result in substantial adverse effects on services provided by the local fire and police providers. The Master Plan is not expected to increase staff levels at the WPCP; the WPF would increase staff levels by three to four workers. While the WPF would increase the number of workers at the WPCP, the WPF at the WPCP would be in a location already served by police and fire and the increase in workers onsite will not be so large as to require the development of new public safety facilities to meet service goals. The Master Plan or WPF would not include or result in the need for additional public facilities, and thus the project would not contribute to any cumulative impact on these services (less-than-significant).

Mitigation Measures: No additional mitigation required.

6.2.12 Utilities

Impact C-UT-1: Implementation of the Master Plan and WPF, combined with other projects in the area, could result in cumulative impacts on utilities and service systems. Less than Significant.

Landfill Capacity

The geographic context for a cumulative impact on landfill capacity is the area that contributes disposal waste to landfills that would be used by the project. As discussed under Impact UT-1 in Section 4.13, disposal of the excavated soil and construction and demolition debris is not anticipated to result in a significant impact but when considered with other development projects, it could contribute to a potentially significant cumulative impact. Considering the amount of remaining disposal capacity at Santa Clara County landfills, there should be sufficient capacity to handle demolition waste resulting from the Master Plan or WPF in combination with cumulative projects. Because uncontaminated soils can be retained and used onsite, used as landfill cover, or otherwise recycled, it would not impact landfill disposal capacity; in addition, as described in Chapter 3 Section 3.4.8, Construction Characteristics, recyclable demolition materials would be reused or recycled consistent with the City’s Zero Waste Strategic Plan and other City requirements. Similar to the Master Plan or WPF, other projects in the vicinity would also be subject to Sunnyvale’s Zero Waste Policy and Zero Waste Strategic Plan, which would
reduce estimated increases in solid waste generation and the potential for a significant cumulative impact on landfill capacity. Compliance with local source reduction and recycling requirements would reduce the Master Plan's or WPF's contribution to a cumulative impact on landfill capacity during construction to less than cumulatively considerable (less than significant).

As discussed under Impact UT-1 in Section 4.13, between the Newby Island, Kirby Canyon, and Potrero Hills Landfills, adequate disposal capacity is expected to be available to accept projected WPCP biosolids. In addition, with a thermal drying facility in place, the volume of solids produced could be further reduced. Based on the expected availability of disposal capacity, in addition to options available to the City to both reduce biosolids volume and diversify the disposition of biosolids produced at the WPCP (e.g., through land application or use of additional disposal facilities), it is expected that the cumulative impact on landfill capacity of biosolids generated under the Master Plan or WPF would be less than cumulatively considerable (less than significant).

**Compliance with Solid Waste Laws and Regulations**

Construction and operation of the Master Plan or WFP would comply with all applicable federal, state, and local statutes and regulations related to solid waste (as discussed under Impacts UT-2 and WPF-UT-2 in Section 4.13) and therefore would not contribute to a potential cumulative impact related to violation of solid waste laws or regulations.

**Mitigation Measures:** No additional mitigation required.

### 6.2.13 Cultural Resources

**Impact C-CUL-1: Implementation of the Master Plan and WPF, combined with other projects, could result in cumulative impacts on Cultural and Paleontological Resources. Less than Significant.**

The cumulative geographic context for cultural resources includes the WPCP and vicinity, in addition to all parts of the City and the Santa Clara Valley. Of the completed, approved and pending projects listed in Table 6-1, any that have or would involve demolition or substantial alteration of one or more existing buildings to accommodate new construction would have the potential to result in an adverse effect to built-environment historical resources, if the buildings subject to demolition or alteration are more than 45 years old and are historical resources pursuant to CEQA Guidelines Section 15064.5. Some of these projects would likely involve ground-disturbing activities that would have the potential to directly or indirectly affect subsurface cultural resources (i.e., archaeological sites, paleontological resources, and human remains).

None of the current and reasonably foreseeable future projects in the cumulative scenario, including flood protection and restoration projects as well as commercial and residential developments, are anticipated to significantly affect historical resources in manner that could combine with the impacts of the proposed project to form a significant cumulative impact. Some
of these current or future projects would potentially impact ponds or other features that contribute to the Alviso Salt Ponds Historic District, similar to the Master Plan and WPF. Even if significant impacts to historical resources were identified as part of CEQA review for the current and reasonably foreseeable future projects, they could be reduced through the application of measures similar to Mitigation Measure CUL-1 (Assessment of Effects to Cargill Channel), which would ensure that impacts would be reduced to a less-than-significant level by requiring additional documentation of contributing elements to the Alviso Salt Ponds Historic District, as well as appropriate public interpretation efforts such as videotaping resources, a public outreach program, or signage.

All of the identified current and reasonably foreseeable future projects that involve ground disturbance have the potential to combine with the impacts of the Master Plan and WPF to form cumulative impact to unknown/unrecorded buried cultural or paleontological resources. All of these ground disturbing cumulative projects as well as the Master Plan and WPF have been, or would be, required to adhere to the standard mitigation measures developed for the protection of archaeological resources, paleontological resources, and human remains, similar to the following measures for the Master Plan: Mitigation Measure CUL-2 (Unanticipated Discovery of Archaeological Resources), for the discovery of archaeological resources during construction; Mitigation Measure CUL-3 (Unanticipated Discovery of Paleontological Resources), for the discovery of paleontological resources during construction; and Mitigation Measure CUL-4 (Unanticipated Discovery of Human Remains), for the discovery of human remains during construction; and, as applicable, measures similar to those identified for the WPF: Mitigation Measure WPF-CUL-1 (Project-Level Cultural Resources Assessment) and WPF-CUL-3 (Project-Level Paleontological Resources Assessment). As such, no significant cumulative impact to archaeological resources, paleontological resources, or human remains is anticipated (less-than-significant).

Mitigation Measures: No additional mitigation required.

6.2.14 Aesthetics

Impact C-AES-1: Implementation of the Master Plan and WPF, combined with other projects, could result in cumulative impacts on aesthetic resources. Less than Significant.

The geographic scope of potential cumulative impacts on aesthetic resources encompasses the Master Plan area and immediately surrounding areas. As discussed in Impact AES-1 in Section 4.15, the Master Plan would have a significant impact on the visual character of the site and its surroundings due to the construction of new diurnal equalization tanks and emergency storage basins and related improvements to the access road. These facilities would substantially alter the visual character within the pond area. Implementation of Mitigation Measures AES-1 (Levee Plantings and Visual Screening) would require inclusion of landscape plantings along the reconstructed access road and installation of a fence with aesthetic treatments around the diurnal equalization and related facilities. Although these developments in the pond area would permanently alter the open space character of the existing lands even with implementation of
these mitigation measures, other projects proposed in the vicinity of the Master Plan area would not occur within this same viewshed. Therefore, the Master Plan and other projects in the vicinity would not result in a cumulative impact on the visual character of the WPCP and surroundings (less than significant). As discussed under Impact AES-2, lighting at the WPCP under the Master Plan would be similar to current lighting at the WPCP. No new lighting would be associated with operation of the groundwater replenishment facilities. Therefore the contribution of the Master Plan and WPF to a cumulative impact related to permanent new sources of light and glare would not be considerable and would be less than significant.

Mitigation Measures: No additional mitigation required.

6.2.15 Energy

Impact C-ENER-1: Implementation of the Master Plan and WPF, combined with other projects in the area, would not result in cumulative impacts to local and regional energy resources by resulting in wasteful, inefficient, and/or unnecessary consumption of energy. Less than Significant.

The geographic scope for the analysis of potential cumulative impacts related to energy resources encompasses the Master Plan area and the broader region. Construction of the proposed WPCP improvements and the WPF would entail use of fuels and electricity for typical construction practices; however, because project-specific, construction-related energy demand would be temporary and not be expected to have a material effect on energy resources or result in wasteful or unnecessary use of energy, the temporal scope of impacts associated with the Master Plan would be limited to operation of the Master Plan or the WPF.

Operation of the proposed WPCP improvements and WPF would require the use of additional energy, and could result in consumption of large amounts of fuel, or result in demand for electricity that is greater than demand under existing conditions. Implementation of the FOG facility would help offset but not entirely replace the amount of electricity needed from PG&E. However, as described in Section 4.16, Energy Conservation, the design of project facilities and processes encourage energy efficiency and conservation, and would not result in the wasteful use of fuel or energy. Other cumulative projects in the area would also require use of fuel and energy for construction and operation activities, and could result in increased demand on local and regional energy resources. Other projects within and/or near the Master Plan and WPF areas would also be required to comply with applicable policies and energy efficiency measures. The cumulative effect of these projects, while potentially increasing energy demand, would not result in wasteful use of fuel or energy. Accordingly, no significant cumulative impact would result from the cumulative scenario to which the Master Plan’s incremental impact could contribute.

Mitigation Measures: No additional mitigation required.
6.3 Significant Environmental Effects That Cannot Be Avoided if the Proposed Project Is Implemented

In accordance with Section 21100(b)(2)(A) of CEQA and with Sections 15126(b) and 15126.2(b) of the CEQA Guidelines, the purpose of this section is to identify project-related environmental impacts that could not be eliminated or reduced to a less-than-significant level with implementation of mitigation measures identified in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures; Chapter 5, Growth Inducement Potential and Secondary Effects of Growth; and Section 6.2 of this chapter, Cumulative Impacts. With the exceptions described below, all Master Plan impacts would either be less than significant or reduced to less-than-significant levels with implementation of the identified mitigation measures:

Master Plan

• **Air Quality.** Construction emissions associated with construction of several stages of the Master Plan and WPF and other proposed land uses could exceed the significance thresholds for criteria pollutants even with implementation of control measures, which would conflict with implementation of the applicable air quality plan and contribute to a significant cumulative impact (see Impacts AQ-1 and AQ-2 in Section 4.5, Air Quality and Impact C-AQ-1, in Section 6.2, above).

• **Secondary Effects of Growth.** The Master Plan would indirectly support development by removing obstacles to growth (inadequate wastewater treatment capacity after year 2025), enabling growth under the approved general plans within the WPCP service area to occur. While numerous federal, state, regional and local agencies exercise the authority to reduce the effects of development on the environment, some unavoidable impacts would still be expected to occur (see Impact GI-1 in Section 5.4, Impacts and Mitigation Measures: Secondary Effects of Growth).

• **Biological Resources.** Proposed restoration of oxidation Ponds 1 and 2 in combination with the South Bay Salt Pond Restoration Project, as well as the South San Francisco Bay Shoreline Study and the San José/Santa Clara Regional Wastewater Facility Master Plan, could adversely affect one species in particular, the ruddy duck (*Oxyura jamaicensis*), which uses the oxidation ponds and other managed ponds in the South Bay as habitat. Although the Master Plan is significantly smaller than the South Bay Salt Pond Restoration Project, restoration of the oxidation ponds could affect this species; the Master Plan’s contribution to this cumulative impact could be cumulatively considerable (see Impact C-BIO in Section 6.2.6, above).

WPF

In addition to the impacts discussed above for the Master Plan, the WPF would also result in the following significant unavoidable impact:

• **Noise.** Noise associated with construction of the injection wells would increase ambient noise levels near sensitive receptors and could occur outside normal hours allowed by local noise ordinance, even with implementation of identified mitigation measures (see Impact WPF-NOI-1 in Section 4.4, Noise and Vibration).
6.4 Significant Irreversible Environmental Changes

In accordance with CEQA Section 21100(b) (2) (B) and CEQA Guidelines Sections 15126(c) and 15126.2(c), the purpose of this section is to identify significant irreversible environmental changes that would be caused by the proposed project.

Construction and operational impacts associated with implementation of the Master Plan would result in an irretrievable and irreversible commitment of natural resources through the use of fossil fuels and construction materials. The Master Plan would require the commitment of energy resources to fuel and maintain construction equipment (such as gasoline, diesel, and oil) during the construction period. Project construction would commit resources, such as concrete and steel, to be used for the proposed facilities and related improvements.

Operation of project facilities would result in irreversible changes associated with increased energy demand; energy usage and greenhouse gas emissions for operation of Master Plan improvements, although a portion of energy demand for operation of WPCP facilities would be met with energy derived from biogas. The Master Plan would be implemented in lands already committed to wastewater treatment.

6.5 References


California Air Pollution Control Officers Association (CAPCOA), 2008. CEQA & Climate Change, January 2008.


City of San José. 2013. San José/Santa Clara Water Pollution Control Plant Master Plan Environmental Impact Report; State Clearinghouse No. 2011052074; City of San José File Number PP11-403. Adopted November 2013.


City of Sunnyvale. 2015. Sunnyvale Water Pollution Control Plant Primary Treatment Facility Project Initial Study/Mitigated Negative Declaration (SCH Number 2014112037). Approved May 2015.


Santa Clara Valley Water District. 2015. Sunnyvale East and West Channels Flood Protection Project Fact Sheet. April 2015


CHAPTER 7
Alternatives

Sections | Tables | Figures
---|---|---
7.1 Introduction | 7-1 City of Sunnyvale Master Plan Objectives | 7-1 Alternative 2: Realigned Access Road Alternative
7.2 Approach to Alternatives Selection | 7-2 Summary of Action Alternatives | 7-2 Alternative 3: Diurnal Equalization and Emergency Storage in Pond 2
7.3 Selected CEQA Alternatives | 7-3 District Water Purification Facilities Objectives | 7-3 Alternative 4: Diurnal Equalization/Emergency Storage in SCVWD Pond A4
7.4 Comparison of Alternatives | 7-4 Impacts of Alternatives 2 Through 5 Compared to the Project
7.5 Alternatives Considered But Eliminated from Further Analysis
7.6 References

7.1 Introduction

This chapter presents the CEQA alternatives analysis for the Sunnyvale Water Pollution Control Plant (WPCP or Plant) Master Plan. The CEQA Guidelines, Section 15126.6(a), state that an environmental impact report (EIR) must describe and evaluate a reasonable range of alternatives to the proposed project that would feasibly attain most of the project’s basic objectives but would avoid or substantially lessen any identified significant adverse environmental effects of the project. Specifically, the CEQA Guidelines (Section 15126.6) set forth the following criteria for selecting and evaluating alternatives:

- **Identifying Alternatives.** The selection of alternatives is limited to those that would avoid or substantially lessen any of the significant effects of the project, are feasible, and would attain most of the basic objectives of the project. Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site. An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. The specific alternative of “no project” must also be evaluated.

- **Range of Alternatives.** An EIR need not consider every conceivable alternative, but must consider and discuss a reasonable range of feasible alternatives in a manner that will foster informed decision-making and public participation. The “rule of reason” governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those
alternatives necessary to permit a reasoned choice. The lead agency (the City of Sunnyvale) is responsible for selecting a range of project alternatives to be examined and for disclosing its reasons for the selection of the alternatives.

- **Evaluation of Alternatives.** EIRs are required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. Matrices may be used to display the major characteristics and the environmental effects of each alternative. If an alternative would cause one or more significant effects that would not result from the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the project.

### 7.2 Approach to Alternatives Selection

#### 7.2.1 Overview

Consistent with CEQA, the City incorporated consideration of environmental impacts as well as environmental benefits into conceptualization, planning and design for the Master Plan. The screening process for alternatives to be evaluated in the PEIR then included reviewing the significant impacts attributable to Master Plan implementation; reviewing comments received during circulation of the Notice of Preparation; evaluating the feasibility of potential alternatives; and considering the ability of potential alternatives to meet most of the basic objectives of the Master Plan. The objectives of the Master Plan (presented in Chapter 3) are reprinted in Table 7-1 below for ease of reference. The range of alternatives was selected to foster informed decision-making and public participation in the CEQA process. Potential alternatives that were screened included those identified during the Master Plan planning process and those identified by EIR preparers.

#### TABLE 7-1

**CITY OF SUNNYVALE MASTER PLAN OBJECTIVES**

| • Develop process improvements to meet current and foreseeable water quality, biosolids, and air quality requirements. | • Provide flexibility in responding to financial and regulatory uncertainty. |
| • Identify process improvements that are cost effective, incorporate innovative solutions and technologies, and promote City goals to maximize water recycling opportunities. | • Maximize the useful life of the existing WPCP facilities in a manner that minimizes rate impacts while maintaining regulatory compliance. |
| • Provide the WPCP with a more reliable power supply through renewable energy generation that provides means to meet future heat and power demands. | • Incorporate a level of redundancy which provides operations and maintenance flexibility to deal with planned and unplanned process downtime. |
| • Maximize the use of available space, enhance safety through improved traffic circulation and access, and improve public access to the WPCP while ensuring site security. | • In partnership with other agencies, protect the WPCP from flooding and risks associated with sea level rise. |
| • Maintain wastewater operations to meet regulatory standards during the course of implementing the Master Plan improvements. | • Minimize life-cycle costs (capital and operation and maintenance) to City rate payers. |

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1. Public Resources Code Section 15004(b)(1).
2. The City received few comments on the Notice of Preparation, none of which were related to potential alternatives.
Section 7.3 describes the selected alternatives and the environmental impacts of each compared to the impacts of the proposed project. Section 7.4 describes the relative ability of each to meet the project objectives and identifies the environmentally superior alternative. Section 7.5 describes the alternatives that were considered but rejected.

7.2.2 Consideration of Environmental Issues during Master Plan Development

As described in Section 2.2 (in Chapter 2, Project Background), the City has been engaged in developing the proposed project since 2008, the overall objective of which was to determine whether to rehabilitate existing plant processes or invest in new facilities to fulfill the water treatment service commitments of the WPCP over the planning period. Numerous alternatives were considered during development of the Master Plan and its predecessor, the Strategic Infrastructure Plan (SIP), the development and evaluation of which considered a variety of environmental factors. Alternatives identified during the SIP included a Plant Rehabilitation Alternative (rehabilitating existing plant processes, including continued use of the oxidation ponds for secondary treatment) and Plant Replacement alternatives (involving conversion of existing processes to conventional activated sludge, membrane bioreactors, or a hybrid approach involving continued use of the oxidation ponds coupled with conventional activated sludge), which were compared based on environmental, social and economic concerns. Factors related to the natural and built environments that were considered during the SIP alternatives evaluation included the following:

- **Regulatory environmental factors**, including the ability to meet existing and anticipated future regulations related to water quality and air quality
- **Non-regulatory environmental factors**, including biosolids reuse, water recycling potential, energy efficiency and recovery, greenhouse gas emissions, use of chemicals, and potential effects on wildlife from continued use of the oxidation ponds.
- **Social factors**, including aesthetics, traffic flow and odor.

The Plant Replacement – Conventional Activated Sludge Alternative ranked highest among those considered in the SIP with respect to the environmental factors listed above.

The Master Plan effort initiated in 2013 and culminating in the project described in PEIR Chapter 3 responded to changes in future regulatory requirements and a projected increase in demand for recycled water. Master Plan efforts included validation of the findings of the SIP, numerous additional studies (e.g., updates to wastewater flows and loads projections, detailed analyses of diurnal equalization requirements, nitrogen and phosphorus loads and treatment options, geotechnical investigations), formulation of project objectives, and further development

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3 The Master Plan incorporates recommendations from the City’s Recycled Water System Master Plan, completed in 2013.

4 Wastewater flows are cyclical, varying within a given 24-hour (diurnal) period as well as seasonally (e.g., during wet and dry weather). The goal of diurnal equalization is to dampen (equalize) flow variations to achieve a more constant flow rate through treatment processes.
7.2.3 Selecting Alternatives for the PEIR

The selection of alternatives for the PEIR focused on identifying alternatives capable of avoiding or reducing significant environmental impacts attributable to the Master Plan (described in Chapters 4, 5 and 6), summarized below:

- **Transportation, Air Quality, and Noise** (Impacts TR-1, TR-2, TR-3, C-TR-1, NOI-1, AQ-1, AQ-2, and C-AQ-1): these impacts are associated with daily construction-phase vehicle trips and equipment usage. Impacts considered significant and unavoidable for these resource areas include the following:

  - **Impacts AQ-1, AQ-2, C-AQ-1**. Daily emissions during certain stages of construction would exceed the significance thresholds for criteria air pollutant emissions even with control measures, which would conflict with the 2010 Clean Air Plan.

- **Biological Resources** (Impacts BIO-1 through BIO-4, BIO-6, C-BIO-1): potential loss of or damage to numerous special status species and their habitat, including Congdon’s tar plant, four special status fish species, western pond turtle, burrowing owl, California Ridgeways rail and California Black rail, and Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew; loss of open water and wetland habitat; loss of protected trees; adverse effects on nesting birds; and loss of or damage to protected trees. Impacts considered significant and unavoidable for this resource area include the following:

  - **Impact C-BIO-1**. Migration routes and movement corridors: potential contribution to significant cumulative impact on ruddy ducks if Ponds 1 and 2 and other managed ponds are restored to salt marsh habitat (thereby reducing managed pond habitat in the South Bay). This impact would occur if Ponds 1 and 2 were restored to salt marsh, rather than open water habitat, a decision which would not be made for many years.
• **Hydrology and Water Quality** (Impacts HYD-2, HYD-3, WQ-4): alteration of existing drainage patterns, risk of loss due to flooding, and potential increase in methyl mercury production from oxidation pond breaching for habitat restoration within the ponds.

• **Hazardous Materials** (Impacts HAZ-2, HAZ-3, and HAZ-5): potential hazard to the public or environment from accidental release of hazardous materials during construction; potential interference with emergency response provider access during project construction.

• **Cultural Resources** (Impacts CUL-1 through CUL-4): potential adverse change in the significance of a historic resource (Cargill Channel), potential impacts on archeological or paleontological resources or human remains from unanticipated discovery.

• **Aesthetics** (Impact AES-1): adverse change in existing visual character of the site (access road and levee).

• **Secondary Effects of Growth** (Impact GI-1): The Master Plan would indirectly support growth by removing obstacles to growth, thereby helping to enable development under the approved general plans within the WPCP and District service areas to occur. As identified in the CEQA documents prepared for projects by the City and other jurisdictions within the WPCP (and, for the WPF, District) service areas, some unavoidable impacts would still occur after mitigation.

The scope of alternatives reviewed also factored into consideration the fundamental purpose of the WPCP (to provide wastewater treatment to land uses within the City), the nature of the project (replacement of facilities at an existing plant, driven largely by the need to replace aging infrastructure while meeting current and anticipated future regulations), and the degree to which components of the Master Plan have been defined to date.5 Other factors considered included long-term significant impacts on the natural environment versus short-term impacts on the built environment, and whether specific aspects of the Master Plan in particular were associated with numerous significant environmental impacts. With respect to effects on the natural environment, the 16.6-acre main plant is already developed; many of the significant impacts expected to occur to the natural environment are associated with development within and near Ponds 1 and 2, particularly construction and operation of the proposed diurnal equalization and emergency storage basins and access road, which affects about 43 acres of open water, salt marsh, and other habitat types. With respect to impacts on the built environment, the location and setting of the WPCP limits the potential for implementation of the Master Plan to adversely affect residential areas (e.g., from noise or odor emanating from the Plant).

The Water Purification Facilities (WPF) variant would generate impacts in addition to those listed above, including potential impacts from discharge of RO concentrate, potential impacts to riparian corridors and roosting bats, and the following significant and unavoidable impact associated with injection well construction:

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5 For example, the lack of definition regarding how restoration would occur within the ponds (e.g., whether the ponds would be restored as salt marsh or open water habitat) effectively limits characterization of impacts and, consequently, also limits identification of alternatives (e.g., an alternative favoring one approach to restoration over another).
7. Alternatives

- **Impact WPF-NOI-1.** Injection well installation would require 24-hour construction, temporarily increasing noise levels in the vicinity. Because specific well sites have not been identified, the ability of proposed mitigation (implementing a Noise and Vibration Reduction Plan and Nighttime Noise and Nuisance Reduction Plan) to reduce the impact to a less-than-significant level cannot be ascertained.

Aspects of the WPF are still in the early stages of development, and much of the information essential to better defining the WPF, better characterizing environmental impacts, and thus identifying alternatives (e.g., the location of injection wells or pipeline route assessments, studies regarding reverse osmosis concentrate discharge and groundwater) is not currently available. (Refer to Section 2.3.1, Preliminary Planning for Indirect Potable Reuse, in Chapter 2 for an overview of studies being undertaken as part of the District’s Expedited and Purified Water Program.) In the future, the District as the lead agency will conduct CEQA on WPF components (and the Expedited Recycled and Purified Water Program) based on more detailed planning and design information than is currently available, facilitating more detailed consideration of impacts, mitigation measures and alternatives to avoid or lessen significant impacts. The information contained in this PEIR can help to incorporate environmental considerations into future WPF conceptualization, planning and design.

### 7.3 Selected CEQA Alternatives

The alternatives selected for analysis in this PEIR are:

- Alternative 1: No Project
- Alternative 2: Realigned Access Road
- Alternative 3: Diurnal Equalization/Emergency Storage in Pond 2
- Alternative 4: Diurnal Equalization/Emergency Storage in SCVWD Pond A4
- Alternative 5: Construction Emissions Reduction Alternative

Table 7-2 summarizes the key similarities and differences between the proposed Master Plan and the “action” alternatives (i.e., excluding Alternative 1, No Project).

#### 7.3.1 Alternative 1: No Project

The CEQA Guidelines require that EIRs include an evaluation of the No Project Alternative to provide decision-makers the information necessary to compare the relative impacts of approving the project and not approving the project. The No Project Alternative is defined as a continuation of existing conditions, as well as conditions that are reasonably expected to occur in the event that the proposed project is not implemented. The discussion below describes two variations of the No Project Alternative: (1) No Master Plan, and (2) No Water Purification Facilities.
### TABLE 7-2
SUMMARY OF ACTION ALTERNATIVES

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<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Main Plant</td>
<td>Secondary, Tertiary, Solids, Energy, Flood Wall</td>
<td>Same as Master Plan</td>
<td>Implement within Pond 2 instead of Pond 1 with associated new access road</td>
<td>Implement within SCVWD Pond A4 instead of Pond 1 with associated new access road</td>
<td>Use of Tier 4&lt;sup&gt;th&lt;/sup&gt; program engines, implementation of Construction Emissions Minimization Plan.</td>
</tr>
<tr>
<td>Oxidation Ponds</td>
<td>Decommissioning of Ponds 1 and 2</td>
<td>Same as Master Plan</td>
<td>Refer to Figure 7-2 for revised area to be restored.</td>
<td>Refer to Figure 7-3 for revised area to be restored.</td>
<td></td>
</tr>
<tr>
<td>Tidal Flood Protection</td>
<td>Similar to the Master Plan, but shifted inland</td>
<td>Same as Master Plan for main plant; see Figure 7-2 for flood protection for diurnal EQ/emergency storage.</td>
<td>Same as Master Plan for main plant; see Figure 7-3 for flood protection for diurnal EQ/emergency storage.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Bay Trail Access Relocation, Administration and Maintenance Buildings</td>
<td>Same as Master Plan</td>
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</tbody>
</table>

NOTES:

<sup>a</sup> Amendments to the Clean Air Act in 1990 defined the use of “tiers” to refer to stages of implementation of vehicle emission standards. The Tier 1 standard was in place until 2004, when more stringent Tier 2 emissions standards became effective, which was subsequently replaced with the Tier 3 standards. The Tier 4 emissions standards for off-road engines began implementation in model year 2008 for certain engines and for all engines types in 2012.

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### No Master Plan

#### Description

If the Master Plan were not implemented, conditions at the site would generally be expected to remain largely the same as described in Section 2.1, Existing WPCP Operations, in Chapter 2, Project Background, and in the setting sections presented throughout Chapter 4 (the exception to this is that the previously approved preliminary and primary treatment facilities at the WPCP, to be constructed beginning in 2016, will be in operation in 2019).

Existing facilities would remain in operation and continue to age. Consequently, the reliability of the plant would likely decline. Because the WPCP must provide adequate wastewater treatment in compliance with applicable permits and for projected increases in flows and loads, it is reasonable to expect that the City would ultimately have to either retrofit existing facilities or
construct new facilities to continue to meet existing and changing requirements, including those pertaining to limits for nitrogen in discharges, disinfection byproducts, constituents of emerging concern, air quality, and standby power.⁶

Environmental Impacts

To the extent that existing conditions within the Master Plan area persist into the future, then none of the environmental impacts attributable to the Master Plan would occur.

The No Master Plan variation of the No Project Alternative would avoid most environmental impacts identified for the proposed WPCP improvements, including the significant and unavoidable impact on air quality, biological resources, and the significant but mitigable impacts associated with traffic, noise, biological resources, hydrology, water quality, hazards and hazardous materials, cultural resources, and aesthetics. However, it is likely that the secondary effects of growth (both significant and unavoidable and significant but mitigable) would still occur with or without implementation of the Master Plan.

Assuming reliability of the WPCP declines in the future, the No Master Plan variation of the No Project Alternative would increase the potential for upset conditions which, if they occurred, would result in adverse effects on effluent water quality and beneficial uses of receiving waters, and potential permit violations. Likewise, the WPCP would remain vulnerable to damage resulting from tidal flooding and/or seismic activity, which in addition to damaging the WPCP could result in water quality degradation if untreated or partially treated wastewater is released. The environmental impacts of continued use of the existing facilities could include degradation of habitat and other beneficial uses of Moffett Channel, Guadalupe Slough, and the San Francisco Bay if pollutants are not effectively removed by the aging facilities.

No Water Purification Facilities

Description

Under the No Water Purification Facilities variation of the No Project Alternative, no water purification facilities would be constructed or operated at the Sunnyvale WPCP. The City would implement the Master Plan as described in Section 3.4 of Chapter 3, Project Description. Facilities to produce purified water at the WPCP would not be constructed. The District would not construct pipelines for the purpose of conveying purified water from the Sunnyvale WPCP to the proposed injection well siting area and the existing recharge basins. The District would not construct wells for the purpose of injecting purified water from the Sunnyvale WPCP.

As described in Sections 3.5.1 and 3.5.2, the District needs additional water supplies to meet projected future water supply shortfalls. In addition, the District must address significant declines in the County’s groundwater levels, which may lead to irreversible subsidence of the land, potentially resulting in catastrophic effects on the County’s infrastructure and economy. Table 7-3

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⁶ See to Table 3-1 in Chapter 3 for more information on these topics.
lists the objectives the District has identified for the WPF. Under the No WPF Alternative, the District’s objectives for using purified water produced at the Sunnyvale WPCP would not be met. Purified water would not be produced at the WPCP to help meet the District’s water supply goals. The District’s ability to develop local, drought-resistant, sustainable water supplies for groundwater recharge and long-term use would be impaired. Whether or not the WPF are implemented, and consistent with the District’s Board Policy E-2.1.4, the District will continue to pursue its Expedited Recycled and Purified Water Program to address these challenges. If the WPF are not implemented, it is reasonable to expect that the District would seek alternative water supplies to make up for the water supply that the WPF could have provided.

### TABLE 7-3
**DISTRICT WATER PURIFICATION FACILITIES OBJECTIVES**

| • Help meet the District’s water supply goals. | • Develop the use of purified water for groundwater recharge, consistent with the District’s adopted Water Supply Strategy. |
| • In partnership with recycled water producers, develop new, local, drought-resistant water supplies. | • Provide a sustainable water supply for long-term/future demands. |
| • Provide flexibility with respect to the District’s potable reuse treatment options. |

**Environmental Impacts**

Under the No WPF Alternative, none of the impacts attributable to the WPF in Chapter 4 would occur. The impacts of implementing Master Plan would be as characterized throughout Chapter 4. Impacts could occur from other District actions taken to develop the water supplies that the WPF would have supplied.

### 7.3.2 Alternative 2: Realigned Access Road

**Description**

The intent of this alternative is to reduce impacts to threatened and endangered species habitat and wetlands/waters of the United States along Moffett Channel attributable to proposed Master Plan improvements to the existing pond access road, which also functions as a levee. Table 7-2 summarizes the key features of this alternative in comparison to the Master Plan; **Figure 7-1** depicts this alternative.

With the project as proposed, implementation of diurnal equalization and emergency storage would include raising the existing levee approximately 5-6 feet to address sea level rise for the design life of the facility. To accommodate the raising of the levee, the existing access road and portions of the berms adjacent to Pond 1 would need to be fortified and widened. Under the Realigned Access Road Alternative, these improvements would be realigned to the west, reducing the amount of fill placed in Moffett Channel. A greater portion of the Cargill Channel (part of the Don Edwards San Francisco Bay National Wildlife Refuge) would be filled than is proposed for the Master Plan. Additional improvements to the existing above-ground primary effluent pipeline, which currently is adjacent to the western edge of the access road, would be implemented to ensure
Diurnal Equalization, Emergency Storage, and Access Road Proposed Under the Master Plan
Realigned Access Road
the structural integrity of the pipeline. As shown in Table 7-2, all other aspects of the Master Plan would be as described in Chapter 3. The objectives and intended benefits of the Master Plan improvements would be achieved under this alternative.

Environmental Impacts of Alternative 2

By shifting the alignment of the access road to the west, into a greater portion of Cargill Channel, the amount of fill placed within Moffett Channel as a result of raising the access road would be reduced. Direct impacts to aquatic habitat in Cargill Channel would be greater than under the Master Plan; however, while salt- and brackish-water invertebrates and fish are present in the Cargill Channel, special-status fish species are not likely to be present due to the poor connection with San Francisco Bay. The narrow strip of salt marsh along the edge of the Cargill Channel is so limited in extent, and is separated from more extensive tidal marsh along Moffett Channel, that it provides relatively low-quality habitat for salt marsh animals. As habitat quality is poorer in Cargill Channel than Moffett Channel, and impacts to special status fish species would decline because these species are more likely to be present in Moffett Channel than in Cargill Channel, the potential impacts of this alternative on special-status wildlife species would be reduced compared to the Master Plan. Similarly, shifting the alignment of the access road to the west would incrementally reduce the adverse effect on visual character due to vegetation removal in Moffett Channel.

This alternative would reduce the potential for erosion, siltation, and flooding in Moffett Channel.

As summarized in Table 7-4 (provided at the end of this chapter), other impacts of Alternative 2 would be the same as or similar to impacts identified for the Master Plan, including traffic and noise generated during construction and operation of the WPCP, air quality impacts, potential for hazardous materials exposure, impacts to special-status plant habitat, the effects on the Alviso Historic District cultural landscape, changes in flooding patterns (except in Moffett Channel as noted above) and potential for flood damage to structures, indirect impacts on nesting birds and the movement of native birds, and tree removal.

7.3.3 Alternative 3: Diurnal Equalization/Emergency Storage in Pond 2

Description

The intent of this alternative is to reduce impacts to threatened and endangered species habitat and wetlands/waters of the U.S. and state near Moffett Channel. These impacts of the Master Plan are associated with improvements to the existing pond access road and the diurnal equalization and emergency storage basins in Pond 1. Table 7-2 summarizes the key features of this alternative in comparison to the proposed Master Plan; Figure 7-2 depicts this alternative.

Under this alternative, the City would construct the proposed diurnal equalization tanks and emergency storage basins in Pond 2, which would be accessed via a new access road and bridge across the Cargill Channel. The existing berm between the Cargill Channel and the Pond 2
Figure 7-2

Alternative 3: Diurnal Equalization and Emergency Storage in Pond 2

SOURCE: ESA, Carollo Engineers, USGS
recirculation channel would require fortification along the outer edge of the proposed diurnal equalization and emergency storage basins for tidal flood protection, as would the location where the bridge would make landfall. Under the Master Plan as proposed, Pond 1 would be taken out of operation to accommodate construction of diurnal equalization and emergency storage facilities. Given the amount of treatment provided by Pond 2, it would not be possible to take Pond 2 out of service during construction. Under current conditions, return flow from the oxidation ponds is pumped from Pond 2 back to the main plant for additional treatment via a pump station located along the southeastern edge of Pond 2. Construction of diurnal equalization and emergency storage facilities in Pond 2 would require alterations to Pond 2’s return flow facilities (pumping plant relocation and return flow pipeline extension, and installation of one or more temporary pipelines and pump stations to convey flows from the ponds to the main plant during construction). In addition, roughly half of the pipes that move water from the recirculation channel would need to be sealed off; this would affect pond hydraulics and the relative distribution of wastewater to the two ponds, potentially affecting effluent water quality. Modifications to the recirculation system would be necessary to prevent these changes in pond hydraulics. The remaining improvements proposed for implementation of the diurnal equalization and emergency storage would be similar to those described in Chapter 3 for the Master Plan, but would occur at the Pond 2 site (i.e., removal of sludge from the pond, improvements to raise and fortify existing berms and site area to accommodate sea level rise; an equalization pump station; and plant water supply pipeline for washdown uses). The area proposed for restoration following decommissioning of Ponds 1 and 2 would be similar in concept and acreage to that proposed under the Master Plan, as the size of the area used in Pond 2 would be the same as proposed for Pond 1 in the Master Plan. As shown in Table 7-2, all other aspects of the Master Plan would be as described in Chapter 3.

Although the City operates pipelines adjacent to and across the Cargill Channel that convey effluent between the main plant and the oxidation ponds, the channel is owned by the U.S. Fish and Wildlife Service (USFWS). This alternative would require agreement between the City of Sunnyvale and the USFWS (as would the project as proposed and Alternative 2) as well as the support of numerous other resource agencies (including the US Army Corps of Engineers, RWQCB, the District, the Bay Conservation and Development Commission, and Coastal Conservancy).

**Environmental Impacts of Alternative 3**

Alternative 3, the impacts of which are summarized in Table 7-4, would entail far less activity along Moffett Channel than would the Master Plan. As a result, impacts related to raising the existing access road and filling Moffett Channel, such as impacts on special-status wildlife species, wetland habitat, protected trees, nesting birds, and visual quality would be reduced compared to the Master Plan. This alternative also reduces the area of Cargill Channel that would be affected. The extent of impacts on suitable habitat for special-status plants along Cargill Channel would thus be reduced relative to the Master Plan. As described in Section 4.7, Biological Resources, the western pond turtle has been documented within the drainage channels west of the Sunnyvale West Channel (although their numbers are expected to be low). Therefore, direct impacts to the levee adjacent to these channels as part of access road construction would potentially increase impacts on western pond turtles compared to the Master Plan. With regard to aesthetics, Constructing diurnal
equalization and emergency storage in Pond 2 and attendant access road would disrupt views of surrounding landscape, but effects would be less extensive (due to location of and extent of disturbed area associated with access road) than with the Master Plan.

The diurnal equalization and emergency storage basins would be protected from tidal flooding because they would be constructed to an appropriate elevation and protected by the fortified berm along the outer edge of the basins, and construction of the new access road and bridge would include the same considerations regarding 100-year flood hazard and future sea level rise as the Master Plan. Because Pond 2 provides more treatment capacity than Pond 1, would have to remain in service during construction, and would require modifications to return flow and pond circulation facilities, Alternative 3 would increase the risk of process upsets, which in turn could result in adverse impacts on receiving water quality and beneficial uses, and permit violations.

Similar to the Master Plan, about 400 acres of the oxidation ponds would be available for restoration with this alternative, and thus would have a similar beneficial effect.

Other impacts of Alternative 3 would be the same as or similar to impacts identified for the Master Plan, including traffic and noise generated during construction and operation of the WPCP, air quality impacts, water quality impacts (except as related to increased likelihood of risk of upset), effects on the Alviso Historic District cultural landscape, changes in flooding patterns and potential for flood damage to structures, and interference with the movement of native birds.

### 7.3.4 Alternative 4: Diurnal Equalization/Emergency Storage in SCVWD Pond A4

**Description**

Like Alternative 3, the intent of this alternative is to reduce impacts attributable to proposed Master Plan improvements to the existing pond access road and provision of flood protection for the proposed diurnal equalization and emergency storage basins in Pond 1. However, under this alternative the diurnal equalization and emergency storage basins and attendant flood protection would instead be constructed much closer to the main plant than either the proposed project or Alternative 3, within SCVWD Pond A4. Constructing these facilities closer to the main plant is preferable to a site within either Pond 1 or Pond 2, where the facilities would be almost completely surrounded by water and wetlands (managed ponds and Moffett Channel). Locating the facilities as close as practicable to the land mass would be advantageous in terms of constructability, ease of operations and maintenance, long-term flood protection and shoreline resilience, and restoration (particularly if the Cargill Channel and the balance of SCVWD Pond A4 were restored as well), and would be more conducive to integrated flood control and restoration concepts such as a horizontal levee or seepage slope. In addition, construction of diurnal equalization and emergency storage facilities in Pond A4 would avoid the increased risk of upset and resultant water quality impacts associated with construction in Ponds 1 or 2. Table 7-2 summarizes the key features of this alternative in comparison to the proposed Master Plan; Figure 7-3 depicts this alternative.
Figure 7-3
Alternative 4: Diurnal Equalization/Emergency Storage in SCVWD Pond A4

SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community; Carollo Engineers
Under this alternative, a new access road and associated pipeline connections for the diurnal equalization and emergency storage facilities would be constructed at the northeast corner of the main plant. As with the proposed project, the City would also construct an equalization pump station and plant water supply pipeline for washdown uses for the diurnal equalization and emergency storage facilities. As shown in Figure 7-3, the acreage of the area proposed for restoration by the City following decommissioning of Ponds 1 and 2 would be greater than proposed under the Master Plan. The remaining improvements would be similar to those described in Chapter 3 for the Master Plan.

The City does not own or otherwise control SCVWD Pond A4; as such, the feasibility of this alternative depends on the cooperation and concurrence of the District (owner of SCVWD Pond A4), and various permitting agencies. The use of SCVWD Pond A4 would require an agreement between the City of Sunnyvale and the District. In addition, this potential alternative—as well as the proposed project and Alternatives 2 and 3—should be considered in conjunction with plans for regional flood protection, currently in the early stages of planning.

**Environmental Impacts of Alternative 4**

While this alternative would lessen some impacts, it would worsen others. Compared to the Master Plan, this alternative would substantially increase the loss of open water habitat that is considered waters of the U.S. and/or state, because SCVWD Pond A4 is considered jurisdictional waters of the U.S. and/or state, whereas Ponds 1 and 2 are not expected to be considered jurisdictional. This alternative would lessen impacts on special-status wildlife species, specifically salt marsh mammals and marsh-associated birds and other nesting birds compared to the Master Plan (because it would lessen impacts on Moffett Channel), and would lessen impacts on Western pond turtle and special-status fish species (because it would lessen impacts in the vicinity of Sunnyvale West Channel). However, impacts to pond-associated birds would be incrementally greater than with the proposed project because a portion of SCVWD Pond A4 would be developed. This alternative would also reduce potential impacts to protected trees since fewer trees would need to be removed compared to the proposed project. Constructing diurnal equalization and emergency storage in SCVWD Pond A4 and attendant access road would disrupt views of the surrounding landscape, but effects would be incrementally less extensive (due to the location and extent of disturbance associated with access road) than with the Master Plan.

With respect to water quality, because the area proposed for restoration would be somewhat greater, the potential for mercury resuspension and methylation (discussed in Section 4.10, Water Quality) would be greater as well. All other impacts associated with this alternative would be similar to those associated with the proposed project.
7.3.5 Alternative 5: Construction Emissions Reduction Alternative

Description

The intent of this alternative is to reduce significant unavoidable impacts associated with construction-phase NOx and other criteria pollutant emissions. As discussed in Section 4.5, Air Quality, criteria pollutant emissions could not be estimated for Stage 1A, Existing WPCP Rehabilitation, Stage 4A, Split Flow Conventional Activated Sludge Expansion (Diurnal Equalization), and Stage 5A (Decommissioning of Ponds 1 and 2); consequently, emissions occurring during construction of these improvements were assumed to be significant and unavoidable. Based on experience with projects of comparable scale and type, NOx, and potentially ROG, emissions are considered more likely to exceed significance thresholds than emissions of other criteria pollutants generated during construction.

The Construction Emissions Reduction Alternative would require of all contractors that off-road equipment greater than 50 horsepower be equipped with engines that meet or exceed U.S. EPA “Tier 4” emission standards. Amendments to the Clean Air Act in 1990 defined the use of “tiers” to refer to stages of implementation of vehicle emission standards. The Tier 1 standard was in place until 2004, when more stringent Tier 2 emissions standards became effective, which was subsequently replaced with the Tier 3 standards. The Tier 4 emissions standards for off-road engines began implementation in model year 2008 for certain engines and for all engines types in 2012. Recent analysis indicates that 22 percent of the statewide off-road equipment fleet is equipped with Tier 4 engines as of 2014.7

This alternative would also include the development of a Construction Emissions Minimization Plan as part of the project. The contents of the Plan would include but not be limited to:

- Certification by the City or contractor that all off-road equipment greater than 50 horsepower will have engines that meet U.S. EPA Tier 4 emissions standards
- Require that all construction equipment, diesel trucks, and generators operate on clean diesel fuels. These products can reduce NOx emissions by 14.5 percent8 and are available within 6 miles of the project site9
- Truck idling time limits and signage
- Equipment maintenance and tune up requirements
- Construction equipment usage reporting requirements
- City certification of compliance with the Plan
- Avoid overlapping construction stages requiring extensive haul of materials (greater than 10,000 cubic yards)

7 San Francisco Department of the Environment et.al., San Francisco Clean Construction Ordinance Implementation Guide for San Francisco Public Projects, Final August 2015
9 http://dieselhpr.com/locations
The construction timeframes and stages proposed for implementation of the Master Plan would likely be extended because there is less equipment available that meets the highest Clean Air Act emissions standards (e.g., Tier 4 engines) and it may therefore be less available due to demand for such equipment, and because this alternative requires that some construction stages (i.e., those involving substantial earthwork and attendant truck trips) be implemented in succession rather than concurrently, to avoid exceeding daily emissions limits. All other aspects of the Master Plan (and WPF) would be as described in Chapter 3.

This alternative could be combined with Alternatives 2, 3, or 4.

## Environmental Impacts of Alternative 5

Alternative 5 would reduce the potential for air quality violations by requiring the use of construction equipment engines that meet or exceed U.S. EPA Tier 4 emissions standards. NOx, ROG, and particulate matter emissions, and associated impacts on public health and the environment, would be reduced under this alternative. In particular, construction-phase NOx emissions for all Master Plan improvements including 1A, Existing WPCP Rehabilitation, 4A, Split Flow Conventional Activated Sludge Expansion (Diurnal Equalization), and 5a, Decommissioning of Ponds 1 and 2, could be reduced to less-than-significant levels.

As shown in Table 7-4, all other proposed aspects of the Master Plan would remain the same as described in Chapter 3, and impacts would be the same as or similar to those identified in Chapter 4 with the exception of air quality impacts during construction. However, since construction duration could increase, the duration of the period during which some impacts could occur (e.g., impacts associated with construction traffic, construction noise, and accidental release of hazardous materials) could increase.

### 7.4 Comparison of Alternatives

#### 7.4.1 Ability to Meet Project Objectives

All of the alternatives except the No Project Alternative would meet most of the basic objectives of the Master Plan and WPF. Alternatives 3, 4 and 5 would likely result in higher costs and therefore would not meet the Master Plan objectives relating to costs or flexibility to respond to financial uncertainty as well as the project. Alternative 5 would likely prolong the overall construction schedule, potentially increasing costs and delaying the time by which the other Master Plan objectives (such as meeting future regulatory requirements) would be achieved.

#### 7.4.2 Environmentally Superior Alternative

The CEQA Guidelines require the identification of an environmentally superior alternative to the proposed project (Section 15126.6). If it is determined that the “no project” alternative would be the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other project alternatives.
As described in Section 7.3.1, the No Project Alternative would avoid most environmental impacts of the WPCP improvements. At the same time, the reliability of the WPCP would be expected to decline due to the Plant’s aging infrastructure, thereby increasing the potential for upset conditions that could result in adverse effects on water quality and beneficial uses of receiving waters, and potential permit violations. The WPCP would remain vulnerable to damage resulting from tidal flooding and/or seismic activity, which could also result in water quality degradation. In addition, restoration of over 400 acres of habitat also would not occur without the project. In consideration of the impacts identified for the Master Plan and the “action” alternatives (Alternatives 2 through 5), the No Project Alternative is not considered the environmentally superior alternative.

The environmental impacts of the action alternatives vary; as a result, there are trade-offs between the environmental impacts of each. Alternatives 2 through 4 were developed primarily to reduce the severity of the impacts of Master Plan implementation on biological and visual resources by shifting the locations of either the diurnal equalization tanks and emergency storage basins or the access road to these facilities, or shifting both. Alternatives 2 through 4 all would decrease the potential loss of or damage to special-status wildlife species relative to the Master Plan. Alternatives 2 and 3 would also reduce the impact of WPCP improvements on open water and wetland habitats, while Alternative 4 would increase the loss of open water habitat considered to be waters of the U.S. or state in SCVWD Pond A4. Alternatives 3 and 4 would reduce the impact of WPCP improvements on special-status plants, protected trees and nesting birds, while Alternative 2 would have the same effects on these resources as those identified for the Master Plan. Alternative 4 would increase the area of potential impacts to pond-associated birds by effectively removing a portion of SCVWD Pond A4 from bird use (in addition to the potential removal of Ponds 1 and 2 from use following decommissioning that could also occur under the Master Plan and Alternative 3). In sum, Alternative 3 is the superior alternative to Alternatives 2 and 4 when considering impacts to biological and visual resources, assuming that engineering solutions can address the operational challenges of continuing to operate Pond 2 during construction of the diurnal equalization and emergency storage facilities. It should be noted that future planning for diurnal equalization and emergency storage may be integrated with, and will be influenced by regional flood protection and restoration planning of projects like the South Bay Shoreline Study.

As noted above in Section 7.3.6, Alternative 5 can be implemented in concert with Alternatives 2 through 4. The environmentally superior alternative is thus a combination of Alternatives 3 and 5. This combined alternative would reduce the air quality impacts of construction to less-than-significant levels while also reducing the severity of impacts to biological and aesthetic resources and providing more contiguous area for restoration than the Master Plan.
7.5 Alternatives Considered but Eliminated From Further Analysis

7.5.1 Alternatives Considered During Master Plan and Strategic Implementation Plan (SIP) Development

For the PEIR, alternatives identified during the Master Plan process and the SIP process that preceded it were reconsidered to determine whether any could reduce some of the significant environmental impacts of the Master Plan while feasibly attaining most of the Master Plan’s basic objectives. The City evaluated a series of treatment alternatives based on screening criteria developed to help implement the City’s objectives. Examples include the following:

- **Plant Rehabilitation.** This alternative involved rehabilitating existing facilities. This alternative was eliminated from consideration in the Master Plan process on the basis that it provided no advantage over the other alternatives and was the least able to comply with more stringent anticipated future regulations; it was eliminated as a whole from further consideration in the PEIR for inability to meet most of the project’s basic objectives (i.e., objectives related to meeting future regulations, incorporating innovative solutions, maximizing water recycling opportunities, providing a more reliable power supply, and providing flexibility and redundancy). One aspect of this alternative, Long-Term Use of Ponds 1 and 2, was retained for consideration in this PEIR and is discussed below.

- **Fixed Growth Reactors (FGRs) and Wetlands.** This alternative proposed using the existing FGRs as well as additional FGRs for secondary treatment. The oxidation ponds would be converted to wetlands, and used and managed for effluent polishing. A benefit of this alternative is that it would have made use of the existing pond space. The City rejected this alternative because it was the most expensive (due to the costs of building an engineered berm around the ponds) and its reliability would have depended on the performance of the wetland process, which is not as well established as the other processes.

- **Aerated Lagoons.** This alternative would convert a portion of the oxidation ponds to aerated lagoons. The City rejected this alternative because it was considered less reliable and less flexible (in terms of operations) than conventional activated sludge for meeting more stringent future regulations.

7.5.2 Long-Term Use of Ponds 1 and 2

**Description**

This alternative was originally considered in 2011 during the peer review of the Strategic Infrastructure Plan (identified as the “FGR and Wetlands Alternative”). At the time, this alternative was rejected in favor of the proposed conventional activated sludge treatment process based on cost (Carollo/HDR, 2014). This alternative was revisited for the PEIR to consider whether its implementation could reduce environmental impacts associated with Master Plan implementation. Under this alternative, the City would continue to conduct secondary treatment using Ponds 1 and 2 and the fixed growth reactors. The City would also construct additional fixed growth reactors. To implement this alternative, the existing levees surrounding Ponds 1 and 2 would need to be raised.
7. Alternatives

and widened to provide protection from tidal flooding and sea level rise (refer to the preliminary levee alignment for the South Bay Shoreline Study shown in Figure 7-3). Construction of a levee encircling the ponds as well as improvements to the access road would require encroachment into Moffett Channel, Cargill Channel, and Guadalupe Slough.

Reasons for Rejection

While water treated by the oxidation ponds would continue to meet current effluent limitations for ammonia, water treated by the oxidation ponds is not anticipated to meet expected future limitations on total nitrogen. Consequently, this alternative would not meet the City’s objectives of meeting current and foreseeable water quality requirements and maintaining wastewater operations to meet regulatory standards. Because this alternative also would be more costly (assuming the City would fund the levee improvements), it may not meet City objective for cost-effective process improvements.

As described in Section 4.7, Biological Resources, federal and state protected and endangered species have occurred within marsh along Guadalupe Slough, and one (green sturgeon) may occur within the waters of the Slough as well. In particular, California Ridgway’s rail nests have been detected at the confluence of Moffett Channel and Guadalupe Slough and in the marsh along Guadalupe Slough directly north of Pond 1. Salt marsh harvest mice have also been captured in Guadalupe Slough. Due to the design of the oxidation ponds (with the recirculation channels on the outside of the main pond areas), fortification of the berms surrounding the ponds to protect from sea level rise and tidal flooding would require disturbance and filling of areas along Guadalupe Slough, including habitat for the species identified above. The amount of fill required would be greater than that proposed under the Master Plan, and would affect more habitat than the fill of Moffett Channel that would occur under the Master Plan, effectively increasing the magnitude of impacts to biological resources when compared to the Master Plan. While continued use of the ponds for secondary treatment would avoid impacts associated with restoration (e.g., increases in methyl mercury production), this alternative would also remove that environmental benefit of the Master Plan: restoration of approximately 400 acres of the oxidation ponds. For these reasons, this alternative does not offer significant environmental advantages over the proposed project.

7.5.3 Reduced Project Alternative: Emergency Storage

Description

Under this alternative the footprint of the emergency storage would be smaller in order to reduce the magnitude of impacts to biological resources (specifically, non-jurisdictional wetlands and waters in the footprint of the basin, and loss of habitat for a variety of water birds) while increasing the area of land available for restoration. This alternative would reduce the overall storage capacity provided by these facilities. These facilities as proposed under the Master Plan would provide three days of primary effluent storage for plant emergency needs. Under current conditions, the use of the oxidation ponds for secondary treatment essentially projects 10 days’ worth of wet weather storage.
7. Alternatives

Reasons for Rejection

The reduction in wastewater storage capacity would impair the ability of treatment operators to manage peak wet weather flows, increasing the potential for sewer system overflows and attendant impacts to public health, water quality, and biological resources. This alternative would fail to meet the City’s level of service goal of providing three days’ worth of storage for primary effluent flows. The WPCP operates 24 hours per day, seven days per week. Any interruption in these operations potentially associated with insufficient emergency storage capacity would pose an unacceptable risk in terms of public health and water quality; thus, this alternative was eliminated prior to PEIR evaluation.

7.5.4 Diurnal Equalization/Emergency Storage at the Landfill

Description

Under this alternative, the proposed diurnal equalization tanks (requiring approximately 5.6 acres) and emergency storage basins (requiring approximately 26 acres) would be placed on the land side of the main plant, within an excavated portion of the closed Sunnyvale Landfill, thereby avoiding impacts associated with constructing these facilities in Pond 1 and freeing up more acreage for potential restoration. The landfill consists of four separate "hills" that abut the WPCP to the west and south, and border the SMaRT Station® (east of the main plant) to the south and east. The site is designated as a Class III Landfill and was used for disposal of non-hazardous residential, commercial, and industrial municipal solid waste and construction debris until 1993. There are institutional and constructability barriers to implementation of this alternative, which would be inconsistent with the Sunnyvale Landfill Final Closure and Post-closure Maintenance Plan and in conflict with standards in the California Code of Regulations Section 21190 for post-closure land uses. There would be significant environmental impacts associated with the breaching the landfill cover, settlement of underlying materials, unstable slopes, potential disruption of the liner, and leakage of contaminated materials. Design plans would need to address landfill gas migration, irrigation, drainage, and final cover modifications and demonstrate to the County of Santa Clara Department of Environmental Health that all hazards associated with the project were properly mitigated. All projects on closed landfills must obtain clearance from the County of Santa Clara Department of Environmental Health as well as concurrence from CalRecycle, the RWQCB and BAAQMD.

Reasons for Rejection

While this potential alternative would avoid some impacts to biological resources, it has been eliminated prior to evaluation based on infeasibility and the scope of likely environmental impacts.

10 The Department of Environmental Health Solid Waste Program is certified by the California Department of Resources, Recycling and Recovery (CalRecycle) as the Local Enforcement Agency (LEA) for the unincorporated areas of Santa Clara County, including all cities except the City of San José, which serves as its own LEA. The LEA regulates solid waste facilities to ensure compliance with state minimum standards.
7.5.5 Satellite Microfiltration/Reverse Osmosis Facility

Description
Recently the District began exploring the feasibility of a satellite purified water facility for treating effluent produced at the Sunnyvale WPCP, to be implemented in combination with groundwater replenishment facilities. Under this alternative, the City would convert existing secondary treatment systems to conventional activated sludge as described in Section 3.4.3 (Chapter 3); the District would construct and operate facilities to convey and treat secondary effluent from the WPCP, which would include a satellite treatment facility and pipeline. The satellite treatment facility likely would include microfiltration, reverse osmosis, ultraviolet disinfection, advanced oxidation processes and possibly storage. No additional details (e.g., potential facility location, operating characteristics, reverse osmosis concentrate management options) are currently available.

Reasons for Rejection
This alternative has been eliminated prior to evaluation in this PEIR based on lack of definition. If the City and District choose to pursue this alternative it would be evaluated in future project-level CEQA.

7.6 References


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<tr>
<td>TR-1: Roadway capacity during construction</td>
<td>LSM. Master Plan activities would temporarily reduce roadway capacity and increase traffic delays, potentially conflicting with applicable measures of effectiveness for the performance of the circulation system.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Similar to the Master Plan. Although construction phasing would likely result in fewer truck trips per day, impacts associated with construction traffic could occur over a longer period.</td>
</tr>
<tr>
<td>TR-2: Traffic safety hazards during construction</td>
<td>LSM. Master Plan activities potentially would increase traffic hazards in the area temporarily due to construction vehicles access requirements and increased truck traffic.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Similar to the Master Plan. Although construction phasing would likely result in fewer truck trips per day, impacts associated with construction traffic could occur over a longer period.</td>
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<tr>
<td>TR-3, HAZ-5: Emergency response access.</td>
<td>LSM.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Similar to the Master Plan. Potential interference with emergency response providers could occur over a longer period.</td>
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<tr>
<td>C-TR-1: Cumulative transportation impacts</td>
<td>LSM. Master Plan activities, in combination with other reasonably foreseeable projects, would reduce capacity of Caribbean Drive, State Route 237, and other local roadways.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Similar to the Master Plan. Although construction phasing would likely result in fewer truck trips per day, impacts associated with construction traffic could occur over a longer period.</td>
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<tr>
<td>NOI-1: Temporary increases in ambient noise levels</td>
<td>LSM. Demolition and construction associated with the implementation of the WPCP improvements would result in temporary increases in ambient noise levels in the WPCP vicinity above existing noise levels and could generate noise levels in excess of standards established in the City of Sunnyvale General Plan and Municipal Code.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Similar to the Master Plan. Although construction noise levels could be incrementally less than with the project (due to use of more modern equipment and fewer truck trips), noise impacts could occur over a longer period due to construction phasing.</td>
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<tr>
<td>AQ-1, WPF-AQ-1: Conflict with the Clean Air Plan</td>
<td>SU. During certain stages of construction, activities would generate emissions at levels that would violate air quality standards, conflicting with the 2010 Clean Air Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Decreased. By requiring the use of construction equipment engines that meet or exceed U.S. EPA Tier 4 emission standards and implementation of a Construction Emissions Minimization Plan, the emissions generated by this alternative would be lower than those identified for the WPCP and this impact would be less than significant.</td>
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<tr>
<td>AQ-2, WPF-AQ-2: Air quality violations</td>
<td>SU. During certain stages of construction, activities would generate emissions at levels that would violate air quality standards.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Decreased. By requiring the use of construction equipment engines that meet or exceed U.S. EPA Tier 4 emission standards and implementation of a Construction Emissions Minimization Plan, the emissions generated by this alternative would be lower than those identified for the WPCP and this impact would be less than significant.</td>
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### 7. Alternatives

#### C-AQ-1: Cumulative Air Quality Impacts

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<td>SU.</td>
<td>Decreased.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Decreased. By requiring the use of construction equipment engines that meet or exceed U.S. EPA Tier 4 emission standards and implementation of a Construction Emissions Minimization Plan, the emissions generated by this alternative would be less than those identified for the WPCP and this impact would be less than significant.</td>
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<tr>
<td>Because construction activities would generate emissions at levels that would violate air quality standards, construction at the WPCP would also contribute considerably to a cumulative impact.</td>
<td>If 40% of the project use occurred while the project was active, in addition to modification of Fonds 1 and 2 that will occur as a result of future restoration.</td>
<td></td>
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<td>Same as the Master Plan.</td>
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#### BIO-1: Loss of or damage to special-status plants.

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<td>LSM.</td>
<td>Same as the Master Plan.</td>
<td>Decreased.</td>
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<td>Same as the Master Plan.</td>
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<tr>
<td>Master Plan could adversely affect Congdon's tar plant, and could potentially introduce or spread invasive plant species.</td>
<td>Although this alternative avoided direct impacts to the tidal Sunnyvale West Channel, this alternative would be less than the extent of suitable habitat affected by the Master Plan. Similar to the proposed project, this alternative could potentially introduce or spread invasive plant species.</td>
<td>Although this alternative could adversely affect Congdon's tar plant, the extent of suitable habitat for Congdon's tarplant (ruderal/nonruderal grasslands) that would be affected along the Cargill Channel under this alternative would be less than the extent of suitable habitat affected by the Master Plan.</td>
<td>Similar to the proposed project, this alternative could potentially introduce or spread invasive plant species.</td>
<td>Same as the Master Plan.</td>
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#### BIO-2: Loss of or damage to special-status wildlife species.

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<td>LSM.</td>
<td>Same as the Master Plan.</td>
<td>Decreased.</td>
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<td>Same as the Master Plan.</td>
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<tr>
<td>Master Plan could adversely affect:</td>
<td>This alternative would reduce potential impacts on salt marsh mammals and marsh-associated birds resulting from the direct loss of suitable marsh habitat in Moffett Channel.</td>
<td>This alternative would reduce potential impacts on salt marsh mammals and marsh-associated birds resulting from the direct loss of suitable marsh habitat in Moffett Channel.</td>
<td>This alternative would reduce potential impacts on salt marsh mammals and marsh-associated birds resulting from the direct loss of suitable marsh habitat in Moffett Channel.</td>
<td>This alternative would reduce potential impacts on salt marsh mammals and marsh-associated birds resulting from the direct loss of suitable marsh habitat in Moffett Channel.</td>
<td>This alternative would reduce potential impacts on salt marsh mammals and marsh-associated birds resulting from the direct loss of suitable marsh habitat in Moffett Channel.</td>
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<tr>
<td>Salt marsh mammals</td>
<td>Direct impacts to aquatic habitat in Cargill Channel would be greater than the proposed project, however potential impacts on special-status fish species would decline because this alternative avoids direct impacts to the tidal Sunnyvale West Channel. Impacts to western pond turtle, raptors, and pond-associated birds would be similar to the proposed project.</td>
<td>Potential impacts on special-status fish species would decline because this alternative avoids direct impacts to the tidal Sunnyvale West Channel. Direct impacts to the levee adjacent to a channel that supports western pond turtles would potentially increase impacts on that species. Potential impacts on raptors and pond-associated birds would be similar to the proposed project.</td>
<td>Potential impacts on raptors and pond-associated birds would be similar to the proposed project.</td>
<td>Potential impacts on raptors and pond-associated birds would be similar to the proposed project.</td>
<td>Potential impacts on raptors and pond-associated birds would be similar to the proposed project.</td>
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#### BIO-3: Loss of or damage to open water and wetland habitats.

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<tr>
<td>LSM.</td>
<td>Same as the Master Plan.</td>
<td>Decreased.</td>
<td>Decreased.</td>
<td>Decreased.</td>
<td>Same as the Master Plan.</td>
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<tr>
<td>Master Plan could adversely affect about 33 acres of open water and wetland habitats, about 3 acres of which would be considered wetlands of waters of the U.S. or state.</td>
<td>This alternative would reduce impacts to higher-quality wetland habitats in Moffett Channel and would increase impacts to open water habitat in Cargill Channel. Overall, the extent of impacts to open water and wetland habitats would be similar, but loss higher-quality habitat would be impacted under this alternative.</td>
<td>This alternative would avoid impacts to higher-quality wetland habitats in Moffett Channel altogether; an increase in impacts to open water habitat in Cargill Channel may be fairly limited, and loss higher-quality habitat would be impacted under this alternative.</td>
<td>This alternative would reduce impacts to high-quality wetland habitats in Moffett Channel and increase loss of open water habitat considered waters of the U.S. and/or state (because SCVWD Pond A4 is considered jurisdictional waters of the U.S./state, whereas active water treatment ponds such as Fonds 1 and 2 are not expected to be considered jurisdictional waters of the U.S./state).</td>
<td>This alternative would reduce impacts to high-quality wetland habitats in Moffett Channel and increase loss of open water habitat considered waters of the U.S. and/or state (because SCVWD Pond A4 is considered jurisdictional waters of the U.S./state, whereas active water treatment ponds such as Fonds 1 and 2 are not expected to be considered jurisdictional waters of the U.S./state).</td>
<td>This alternative would reduce impacts to high-quality wetland habitats in Moffett Channel and increase loss of open water habitat considered waters of the U.S. and/or state (because SCVWD Pond A4 is considered jurisdictional waters of the U.S./state, whereas active water treatment ponds such as Fonds 1 and 2 are not expected to be considered jurisdictional waters of the U.S./state).</td>
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*TABLE 7-4 (Continued) IMPACTS OF ALTERNATIVES 2 THROUGH 5 COMPARED TO THE PROJECT*
### TABLE 7-4 (Continued)

**IMPACTS OF ALTERNATIVES 2 THROUGH 5 COMPARED TO THE PROJECT**

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<tr>
<td>BIO-4: Loss of or damage to protected trees.</td>
<td>LSM. Construction of Master Plan facilities could affect protected trees.</td>
<td>Similar. Of the six trees potentially affected by the access road, two trees meet the City’s definition of “protected tree.” Given their location, it is likely that these trees could still require removal or be damaged by construction of the realigned access road.</td>
<td>Decreased. This alternative would avoid affecting 3 lollypop trees, two of which meet the City’s definition of “protected tree.” Although construction of a new access road to Pond 2 could damage or remove three small trees, these trees do not meet the City’s definition of a “protected tree.”</td>
<td>Decreased. Alternative 4 would affect fewer protected trees compared to the proposed project. Construction of a new access road to SCVWD Pond A4 may damage or remove one or two trees, although the size of these trees is unknown.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td>BIO-6: Nesting birds.</td>
<td>LSM. Master Plan could affect nesting birds.</td>
<td>Similar. Realignment of the access road would reduce direct impacts to high-quality marsh habitat in Moffett Channel, but indirect impacts to nesting birds in that habitat would still occur, and impacts elsewhere would be similar to the Master Plan.</td>
<td>Decreased. Realignment of the access road to Pond 2 would reduce potential impacts on nesting birds associated with the removal of vegetation and would avoid impacts adjacent to high-quality marsh habitat in Moffett Channel.</td>
<td>Decreased. This alternative would reduce potential impacts on nesting birds associated with the removal of vegetation and would reduce impacts adjacent to high-quality marsh habitat in Moffett Channel.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td>C-BIO-1: Implementation of the Master Plan, in combination with other projects, would have a potentially significant contribution to cumulative impacts on biological resources.</td>
<td>SU. The Master Plan would reduce the South Bay pond habitat of ruddy ducks.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Similar. While the area available to be restored to tidal marsh could be greater in this alternative (and thus would reduce the non-tidal habitat preferred by ruddy ducks), the extent of the area removed from use as managed pond would be the same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td>HYD-2: Potential for substantial erosion, siltation, or flooding from changes to Moffett Channel</td>
<td>LSM. Widening of the levee road to support Diurnal EQ/Emergency Storage in Pond 1 could change flooding and erosion patterns in Moffett Channel.</td>
<td>Decreased. Levee road widening would be moved farther from the center of Moffett Channel, potentially maintaining the existing channel conditions.</td>
<td>Decreased. Levee road would not be widened, and no other work would occur along Moffett Channel. Levee improvements would be made along Cargill Channel, which is not connected to upland areas and does not significantly contribute to conveying flood flows.</td>
<td>Similar. The existing berm between Moffett Channel and SCVWD Pond A4 would be raised and fortified, potentially resulting in similar potential effects on channel capacity in Moffett Channel.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td>HYD-3: Risk to life and property resulting from placement of structures within the 100-year floodplain at the WPCP</td>
<td>LSM. Diurnal equalization and emergency storage basins would be installed within 100-year floodplain, and decommissioning of the oxidation ponds could expose new areas to tidal action and more damaging tidal flooding.</td>
<td>Similar. The realigned access road would remain within the 100-year floodplain, and other aspects of the project would be the same as the Master Plan. Similar mitigation would be required to limit the extent of the impact.</td>
<td>Similar. The diurnal equalization tanks and emergency storage basins would be located further inland than proposed under the Master Plan, but would remain within the 100-year floodplain and thus would be exposed to similar risks. These facilities would be surrounded by protective berms similar to those proposed for the Master Plan. Any incidental tidal flooding or sea level rise protection of inland areas provided by fortifying/raising the existing access road would not be realized under this alternative.</td>
<td>Same as Alternative 3</td>
<td>Same as the Master Plan.</td>
</tr>
</tbody>
</table>
### TABLE 7-4 (Continued)
**IMPACTS OF ALTERNATIVES 2 THROUGH 5 COMPARED TO THE PROJECT**

<table>
<thead>
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<tbody>
<tr>
<td><strong>WQ-4:</strong> Oxidation pond breaching</td>
<td>LSM. Oxidation pond breaching and/or restoration could increase methylmercury production.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Increased. The area available for restoration after decommissioning of Ponds 1 and 2 would be larger in this alternative than proposed under the Master Plan, because the diurnal equalization tanks and emergency storage basins would be within SCVWD Pond A4, instead of a portion of Pond 1. The area of potential mercury resuspension and methylation would be greater than under the Master Plan.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td>Note: refer also to discussions under HAZ-2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>HAZ-2:</strong> Release of hazardous materials into the environment</td>
<td>LSM. Demolition of buildings at the main plant, excavation near the Sunnyvale Landfill, and work in Pond 1 sediments could result in exposure of the public or the environment to hazardous materials</td>
<td>Same as the Master Plan.</td>
<td>Increased. Work in Pond 2 sediments would pose a similar risk of release as Pond 1 because both ponds have a similar use history (thus materials present in the sediments exhibit similar metal contents). Because Pond 2 provides more treatment capacity than Pond 1, because Pond 2 must remain in service during construction, and because of changes needed to pond return flow and recirculation facilities, construction within Pond 2 would incrementally increase the likelihood of occurrence of upset conditions, including potential adverse effects on water quality and beneficial uses of receiving waters.</td>
<td>Same as the Master Plan. SCVWD Pond A4 is not listed as a hazardous materials cleanup site or a permitted hazardous waste site; however, the content of the sediments is not known and mitigation limiting exposure of the public and the environment to hazardous materials may be required.</td>
<td>Same as the Master Plan. The potential impact could occur over a longer period due to a longer overall construction schedule as a result of construction phasing.</td>
</tr>
<tr>
<td><strong>HAZ-3:</strong> Portions of the Master Plan located on a list of hazardous materials sites</td>
<td>LSM. Work at the main plant would include excavation adjacent to the Sunnyvale Landfill and the BOP/Recycling Center, potentially creating a significant hazard to the public or the environment.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td><strong>HAZ-5:</strong> Interference with emergency response provider access</td>
<td>LSM. Construction on Caribbean Drive for relocated trail access could temporarily interfere with emergency response provider access.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td><strong>CUL-1:</strong> Adverse change to a historical resource</td>
<td>LSM. Disturbance of the Cargill Channel, a potential contributing element to the Alviso Salt Ponds Historic District, could potentially affect the integrity of this cultural landscape.</td>
<td>Similar. While this alternative would result in more filling of the Cargill Channel than the proposed Master Plan, the resulting effect on the integrity of the cultural landscape would essentially be the same.</td>
<td>Similar. This alternative would not require as much fill in the Cargill Channel as the Master Plan, but would construct a bridge over Cargill Channel, also potentially affecting the integrity of the cultural landscape.</td>
<td>Similar. SCVWD Pond A4 is mapped within the boundaries of the Alviso Salt Ponds Historic District. Placement of the diurnal equalization tanks and emergency storage basins within Pond A4 would potentially affect the integrity of the Historic District.</td>
<td>Same as the Master Plan.</td>
</tr>
</tbody>
</table>
TABLE 7-4 (Continued)
IMPACTS OF ALTERNATIVES 2 THROUGH 5 COMPARED TO THE PROJECT

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>CUL-2: Unanticipated discovery of archaeological resources</td>
<td>LSM.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td>CUL-3: Unanticipated discovery of paleontological resources</td>
<td>LSM.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td>CUL-4: Unanticipated discovery of human remains</td>
<td>LSM.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
</tr>
<tr>
<td>AES-1: Change in visual character of site.</td>
<td>LSM.</td>
<td>Decreased.</td>
<td>Decreased.</td>
<td>Decreased.</td>
<td>Same as Master Plan.</td>
</tr>
<tr>
<td>GI-1: Secondary effects of growth</td>
<td>SU.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
<td>Same as the Master Plan.</td>
</tr>
</tbody>
</table>

LTS = Less than Significant; LSM = Less than Significant with Mitigation; SU = Significant and Unavoidable

NOTES:

a. This table does not include less-than-significant impacts of the proposed project.
CHAPTER 8
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CHAPTER 9
Acronyms and Abbreviations

µg/m$^3$ micrograms per cubic meter
µg/L micrograms per liter
µPa micro-Pascals
2010 CAP Bay Area Clean Air Plan
2012 GWMP 2012 Groundwater Management Plan
AB Assembly Bill
ABAG Association of Bay Area Governments
AC asphalt concrete
ACE Altamont Commuter Express
ACM asbestos-containing materials
ADWF average dry weather flow
AFTs Air Flotation Tanks
AFY acre-feet per year
ANSI American National Standards Institute
AOP advanced oxidation process
AR aquifer recharge
ASCE American Society of Civil Engineers
ASR aquifer storage and recovery
ATSDR U.S. Agency for Toxic Substances and Disease Registry
AWWA American Water Works Association
BAAQMD Bay Area Air Quality Management District
Basin Plan Water Quality Control Plan for the San Francisco Bay Basin
the Bay San Francisco Bay
Bay Plan San Francisco Bay Plan
BCDC San Francisco Bay Conservation and Development Commission
BFE base flood elevation
bgs below ground surface
BMPs best management practices
<table>
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<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>BOD</td>
<td>Biological Oxygen Demand</td>
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<tr>
<td>°C</td>
<td>Celsius</td>
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<tr>
<td>CAAQS</td>
<td>California Ambient Air Quality Standards</td>
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<tr>
<td>Cal EPA</td>
<td>California Environmental Protection Agency</td>
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<tr>
<td>CAFE</td>
<td>corporate average fuel economy</td>
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<td>CalGreen</td>
<td>California Green Building Standards Code</td>
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<td>Cal- IPC</td>
<td>California Invasive Plant Council</td>
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<tr>
<td>Cal/OSHA</td>
<td>California Occupational Safety and Health Administration</td>
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<tr>
<td>CalRecycle</td>
<td>California Department of Resources, Recycling and Recovery</td>
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<tr>
<td>Caltrans</td>
<td>California Department of Transportation</td>
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<tr>
<td>CAP</td>
<td>Climate Action Plan</td>
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<td>CAPCOA</td>
<td>California Air Pollution Control Officers Association</td>
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<tr>
<td>CARB</td>
<td>California Air Resources Board</td>
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<tr>
<td>CASGEM</td>
<td>California Statewide Groundwater Elevation Monitoring</td>
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<td>CASQA</td>
<td>California Stormwater Quality Association</td>
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<td>CBC</td>
<td>California Building Code</td>
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<td>CBOD</td>
<td>carbonaceous biochemical oxygen demand</td>
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<td>CCAR</td>
<td>California Climate Action Registry</td>
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<td>CCP</td>
<td>comprehensive conservation plan</td>
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<td>California Code of Regulations</td>
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<td>California Department of Fish and Wildlife</td>
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<td>CEC</td>
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<tr>
<td>CECs</td>
<td>Contaminants of Emerging Concern</td>
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<td>CEPT</td>
<td>Chemically Enhanced Primary Treatment</td>
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<td>CEQA</td>
<td>California Environmental Quality Act</td>
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<td>CESA</td>
<td>California Endangered Species Act</td>
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<td>CFR</td>
<td>Code of Federal Regulations</td>
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<tr>
<td>CGS</td>
<td>California Geological Survey</td>
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<td>CH₄</td>
<td>Methane</td>
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<td>CHHSLs</td>
<td>California EPA Human Health Screening Levels</td>
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<td>CIP</td>
<td>Clean In Place</td>
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<td>City</td>
<td>City of Sunnyvale</td>
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<td>CMA</td>
<td>Congestion Management Agency</td>
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<tr>
<td>Acronym</td>
<td>Definition</td>
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<tr>
<td>---------</td>
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<tr>
<td>CMP</td>
<td>Congestion Management Program</td>
</tr>
<tr>
<td>CN</td>
<td>Commercial Neighborhood</td>
</tr>
<tr>
<td>CNDDB</td>
<td>California Natural Diversity Database</td>
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<tr>
<td>CNEL</td>
<td>Community Noise Equivalent Level</td>
</tr>
<tr>
<td>CNPS</td>
<td>California Native Plant Society</td>
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<tr>
<td>CO</td>
<td>Commercial Office District</td>
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<tr>
<td>CO</td>
<td>Carbon monoxide</td>
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<tr>
<td>CO-CAT</td>
<td>Coastal and Ocean Working Group of the California Climate Action Team</td>
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<tr>
<td>CO₂</td>
<td>Carbon dioxide</td>
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<tr>
<td>CO₂e</td>
<td>carbon dioxide-equivalent emissions</td>
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<td>CPUC</td>
<td>California Public Utilities Commission</td>
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<td>CRPR</td>
<td>California Rare Plant Rank</td>
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<td>CRSR</td>
<td>cultural resources survey report</td>
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<td>CSSC</td>
<td>California Species of Special Concern</td>
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<td>CUL</td>
<td>Cultural Resources</td>
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<td>CUPA</td>
<td>Certified Unified Program Agency</td>
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<td>DAF</td>
<td>Dissolved Air Flotation</td>
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<td>dB</td>
<td>decibels</td>
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<td>dBA</td>
<td>A-weighted noise level</td>
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<tr>
<td>DDT</td>
<td>Dichlorodiphenyltrichloroethane</td>
</tr>
<tr>
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<td>Division of Drinking Water</td>
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<tr>
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<td>Department of Environmental Health</td>
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<td>DEHP</td>
<td>bis(2-ethylhexyl) phthalate</td>
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<td>California Department of Health Services</td>
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<td>District</td>
<td>Santa Clara Valley Water District</td>
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<td>Day-Night Average Level</td>
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<td>DO</td>
<td>Dissolved Oxygen</td>
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<td>Don Edwards National Wildlife Refuge</td>
<td>Don Edwards San Francisco Bay National Wildlife Refuge</td>
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<td>DPM</td>
<td>diesel particulate matter</td>
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<td>Direct Potable Reuse</td>
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<td>Distinct Population Segments</td>
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<td>California Department of Toxic Substances Control</td>
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<td>Acronym</td>
<td>Full Form</td>
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<td>California Department of Water Resources</td>
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<td>East Bay Dischargers Authority</td>
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<td>environmental impact report</td>
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<td>environmental impact statement</td>
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<td>Emergency Medical</td>
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<td>ENER</td>
<td>Energy</td>
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<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
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<td>Environmental Screening Levels</td>
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<td>ESU</td>
<td>Evolutionarily Significant Units</td>
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<td>°F</td>
<td>Fahrenheit</td>
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<tr>
<td>Farmland</td>
<td>Prime Farmland, Unique Farmland, or Farmland of Statewide Importance</td>
</tr>
<tr>
<td>FEMA</td>
<td>Federal Emergency Management Agency</td>
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<td>FESA</td>
<td>Federal Endangered Species Act</td>
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<td>FGRs</td>
<td>Fixed Growth Reactors</td>
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<td>FIRM</td>
<td>Flood Insurance Rate Map</td>
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<td>FMPs</td>
<td>fishery management plans</td>
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<td>FOG</td>
<td>fats, oils, and grease</td>
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<td>FSE</td>
<td>flood safe elevation</td>
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<tr>
<td>FTA</td>
<td>Federal Transit Administration</td>
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<td>g</td>
<td>Gravity</td>
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<td>Greenhouse Gas</td>
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<td>groundwater replenishment</td>
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<td>HAA5</td>
<td>Haloacetic Acids</td>
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<td>Historic American Landscapes Survey</td>
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<td>Highway Capacity Manual</td>
</tr>
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<td>HDM</td>
<td>Highway Design Manual</td>
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<tr>
<td>HFCs</td>
<td>hydrofluorocarbons</td>
</tr>
<tr>
<td>HMBP</td>
<td>Hazardous Materials Business Plan</td>
</tr>
<tr>
<td>HMMP</td>
<td>Habitat Mitigation and Monitoring Plan</td>
</tr>
<tr>
<td>HOV</td>
<td>high occupancy vehicle</td>
</tr>
<tr>
<td>hp</td>
<td>horsepower</td>
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<tr>
<td>H&amp;SC</td>
<td>Health and Safety Code</td>
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<tr>
<td>HTH</td>
<td>H.T. Harvey and Associates</td>
</tr>
<tr>
<td>Hz</td>
<td>Hertz</td>
</tr>
<tr>
<td>Acronym</td>
<td>Abbreviation</td>
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</tr>
<tr>
<td>I-880</td>
<td>Interstate 880</td>
</tr>
<tr>
<td>IDSE</td>
<td>Initial Distribution System Evaluation</td>
</tr>
<tr>
<td>in/sec</td>
<td>inches per second</td>
</tr>
<tr>
<td>IPCC</td>
<td>International Panel on Climate Change</td>
</tr>
<tr>
<td>IPR</td>
<td>indirect potable reuse</td>
</tr>
<tr>
<td>JUA</td>
<td>Joint Use Agreement</td>
</tr>
<tr>
<td>Kg</td>
<td>kilograms</td>
</tr>
<tr>
<td>kV</td>
<td>kilovolt</td>
</tr>
<tr>
<td>kW</td>
<td>kilowatt</td>
</tr>
<tr>
<td>LBP</td>
<td>lead-based paint</td>
</tr>
<tr>
<td>LDT1</td>
<td>Light Duty Trucks 1 with a Gross Vehicle Weight Rating less than 6,000 pounds and Equivalent Test Weight less than or equal to 3,750 pounds.</td>
</tr>
<tr>
<td>LEA</td>
<td>Local Enforcement Agency</td>
</tr>
<tr>
<td>L_{eq}</td>
<td>Equivalent Sound Level</td>
</tr>
<tr>
<td>L_{dn}/DNL</td>
<td>Day-Night Average Level</td>
</tr>
<tr>
<td>L_{max}</td>
<td>Maximum Sound Level</td>
</tr>
<tr>
<td>LOS</td>
<td>Level of Service</td>
</tr>
<tr>
<td>LRAA</td>
<td>locational running annual average</td>
</tr>
<tr>
<td>LS</td>
<td>Less than Significant impact, no mitigation required</td>
</tr>
<tr>
<td>LSM</td>
<td>Less than Significant impact with Mitigation</td>
</tr>
<tr>
<td>LUST</td>
<td>Leaking Underground Storage</td>
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<td>LUTE</td>
<td>Land Use and Transportation Element</td>
</tr>
<tr>
<td>M</td>
<td>Richter Magnitude</td>
</tr>
<tr>
<td>M-10, M-12.5</td>
<td>Medium Density Residential</td>
</tr>
<tr>
<td>Master Plan</td>
<td>Sunnyvale Water Pollution Control Plant Master Plan</td>
</tr>
<tr>
<td>MBR</td>
<td>membrane bioreactor</td>
</tr>
<tr>
<td>MCLs</td>
<td>maximum contaminant levels</td>
</tr>
<tr>
<td>mg</td>
<td>million gallon</td>
</tr>
<tr>
<td>mg/L</td>
<td>milligrams per liter</td>
</tr>
<tr>
<td>mgd</td>
<td>million gallons per day</td>
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<td>MHW</td>
<td>mean high water</td>
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<tr>
<td>ml</td>
<td>milliliters</td>
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<tr>
<td>ML</td>
<td>Mixed Liquor (effluent from aeration basins)</td>
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<tr>
<td>MMI</td>
<td>Modified Mercalli Intensity</td>
</tr>
<tr>
<td>MMPA</td>
<td>Marine Mammal Protection Act</td>
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</table>
mpg  miles per gallon
MPN  most probable number
MPO  Metropolitan Planning Organization
MRDS  Mineral Resources Data System
MRP  Municipal Regional Stormwater NPDES Permit
MRZs  Mineral Resource Zones
MSL  mean sea level
MTBE  methyl-tert-butyl ether
Mw  Moment Magnitude scale
MW  megawatt
MWh  megawatt-hour
N₂  dinitrogen gas
NA  Not Available
NAAQS  National Ambient Air Quality Standards
NAVD  North American Vertical Datum
NAVD88  North American Vertical Datum, 1988
NCBI  National Center for Biotechnology Information
NDMA  n-nitrosodimethylamine
NH₃  ammonia
NH₄⁺  ammonium
NHPA  National Historic Preservation Act of 1966
NI  No Impact
NMFS  National Marine Fisheries Service
NOP  Notice of Preparation
NO  nitric oxide
NO₂  Nitrogen dioxide
NO₃⁻  nitrate
N₂O  nitrous oxide
NOAA  National Oceanic and Atmospheric Administration
NOₓ  nitrogen oxides
NOI  Noise and Vibration
NOP  Notice of Preparation
NPDES  National Pollutant Discharge Elimination System
NPPA  Native Plant Protection Act
NRCS  Natural Resources Conservation Service
NTU  Nephelometric Turbidity Units
<table>
<thead>
<tr>
<th>Acronym</th>
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<tr>
<td>NWIC</td>
<td>Northwest Information Center</td>
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<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
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<tr>
<td>OS-OR</td>
<td>Open Space-Outdoor Recreation</td>
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<tr>
<td>OSPH</td>
<td>Open Space, Parklands and Habitat</td>
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<td>PE</td>
<td>Primary Effluent</td>
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<td>PEIR</td>
<td>Program environmental impact report</td>
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<td>PCA</td>
<td>Pest Control Advisor</td>
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<td>pc/h/l</td>
<td>Passenger cars per hour per travel lane</td>
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<td>PCBs</td>
<td>Polychlorinated biphenyls</td>
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<td>Perchloroethene</td>
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<td>PDR</td>
<td>Planned Development Residential</td>
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<tr>
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<td>Perfluorocarbons</td>
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<td>Pacific Gas and Electric</td>
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<td>PGA</td>
<td>Peak ground acceleration</td>
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<td>PGF</td>
<td>Power Generation Facility</td>
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<td>PI</td>
<td>Plasticity Index</td>
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<tr>
<td>PM10</td>
<td>Particulate matter less than 10 microns in diameter</td>
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<tr>
<td>PM2.5</td>
<td>Particulate matter less than 2.5 microns in diameter</td>
</tr>
<tr>
<td>Porter-Cologne</td>
<td>Porter-Cologne Water Quality Control Act</td>
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<td>ppm</td>
<td>Parts per million</td>
</tr>
<tr>
<td>ppt</td>
<td>Part per thousand</td>
</tr>
<tr>
<td>PPV</td>
<td>Peak Particle Velocity</td>
</tr>
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<td>PQP</td>
<td>Public/Quasi-Public</td>
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<td>PRC</td>
<td>California Public Resources Code</td>
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<tr>
<td>PSHA</td>
<td>Probabilistic seismic hazard assessment</td>
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<tr>
<td>RARE</td>
<td>Richmond Advanced Recycled Expansion Water Project</td>
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<tr>
<td>RAS</td>
<td>Return Activated Sludge</td>
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<tr>
<td>RAS/WAS</td>
<td>Return Activated Sludge/Waste Activated Sludge</td>
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<td>RMS</td>
<td>Root Mean Square</td>
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<tr>
<td>RO</td>
<td>Reverse osmosis</td>
</tr>
<tr>
<td>ROG</td>
<td>Reactive organic gases</td>
</tr>
<tr>
<td>RWC</td>
<td>Recycled Water Contribution</td>
</tr>
<tr>
<td>RWQCB</td>
<td>Regional Water Quality Control Board</td>
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<tr>
<td>SAT</td>
<td>Soil Aquifer Treatment Process</td>
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<tr>
<td>SB</td>
<td>Senate Bill</td>
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<td>SBSP</td>
<td>South Bay Salt Pond</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<td>---------</td>
<td>-------------</td>
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<tr>
<td>SBWR</td>
<td>South Bay Water Recycling</td>
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<td>SCAQMD</td>
<td>South Coast Air Quality Management District</td>
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<tr>
<td>SCCDEH</td>
<td>Santa Clara County Department of Environmental Health</td>
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<tr>
<td>SCH</td>
<td>State Clearinghouse</td>
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<td>SCVHA</td>
<td>Santa Clara Valley Habitat Agency</td>
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<tr>
<td>SCVURPPP</td>
<td>Santa Clara Valley Urban Runoff Pollution Prevention Program</td>
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<td>SCVWD</td>
<td>Santa Clara Valley Water District</td>
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<tr>
<td>SDC</td>
<td>Seismic Design Category</td>
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<td>Safe Drinking Water Act</td>
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<td>SE</td>
<td>Secondary Effluent</td>
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<td>SE</td>
<td>State Endangered</td>
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<tr>
<td>SF₆</td>
<td>Sulfur hexafluoride</td>
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<tr>
<td>SFBBO</td>
<td>San Francisco Bay Bird Observatory</td>
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<tr>
<td>SFPUC</td>
<td>San Francisco Public Utilities Commission</td>
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<tr>
<td>SHPO</td>
<td>State Historic Preservation Officer</td>
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<tr>
<td>Shoreline Study</td>
<td>South San Francisco Bay Shoreline Study</td>
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<tr>
<td>SMARA</td>
<td>Surface Mining and Reclamation Act</td>
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<tr>
<td>SNMP</td>
<td>Salt and Nutrient Management Plan</td>
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<tr>
<td>South Bay</td>
<td>South San Francisco Bay</td>
</tr>
<tr>
<td>SP</td>
<td>State Protected</td>
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<tr>
<td>SPL</td>
<td>sound pressure level</td>
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<tr>
<td>SR</td>
<td>State Route</td>
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<tr>
<td>SSM</td>
<td>Stationary Source Measure</td>
</tr>
<tr>
<td>STLC</td>
<td>soluble threshold limit concentration</td>
</tr>
<tr>
<td>SU</td>
<td>Significant and Unavoidable impact for which mitigation is not available</td>
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<tr>
<td>SVAWPC</td>
<td>Silicon Valley Advanced Water Purification Center</td>
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<tr>
<td>SVOCs</td>
<td>semi-volatile organic compounds</td>
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<td>SWIS</td>
<td>Solid Waste Information System</td>
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<td>SWPPP</td>
<td>Stormwater Pollution Prevention Plan</td>
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<tr>
<td>SWRCB</td>
<td>State Water Resources Control Board</td>
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<tr>
<td>T7</td>
<td>heavy duty diesel single unit construction trucks</td>
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<tr>
<td>TACs</td>
<td>toxic air contaminants</td>
</tr>
<tr>
<td>TCLP</td>
<td>Toxicity Characteristic Leaching Procedure</td>
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<tr>
<td>TDM</td>
<td>Transportation Demand Management</td>
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<tr>
<td>TDS</td>
<td>Total dissolved solids</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------</td>
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<tr>
<td>TEQ</td>
<td>toxic equivalency quantity</td>
</tr>
<tr>
<td>THMs</td>
<td>trihalomethanes</td>
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<tr>
<td>TMDL</td>
<td>total maximum daily load</td>
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<tr>
<td>TOC</td>
<td>Total Organic Carbon</td>
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<tr>
<td>TPH</td>
<td>total petroleum hydrocarbons</td>
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<tr>
<td>T/S</td>
<td>Transformer/Switchgear</td>
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<tr>
<td>TSM</td>
<td>Transportation Systems Management</td>
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<tr>
<td>TSS</td>
<td>total suspended solids</td>
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<tr>
<td>TTC</td>
<td>Temporary Traffic Control</td>
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<tr>
<td>TTHM</td>
<td>Total Trihalomethanes</td>
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<tr>
<td>TTLC</td>
<td>total threshold limit concentration</td>
</tr>
<tr>
<td>UCMP</td>
<td>University of California Museum of Paleontology</td>
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<tr>
<td>Unified Program</td>
<td>Unified Hazardous Waste and Hazardous Materials Management Regulatory Program</td>
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<tr>
<td>URMP</td>
<td>Urban Runoff Management Plan</td>
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<td>U.S. EPA</td>
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<td>U.S. Highway 101</td>
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<td>USACE</td>
<td>U.S. Army Corps of Engineers</td>
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<tr>
<td>USC</td>
<td>U.S. Government Code</td>
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<tr>
<td>USFWS</td>
<td>U.S. Fish and Wildlife Service</td>
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<td>USGS</td>
<td>United States Geological Survey</td>
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<tr>
<td>UV</td>
<td>ultraviolet</td>
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<tr>
<td>UWMP</td>
<td>Urban Water Management Plan</td>
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<td>VdB</td>
<td>decibel notation</td>
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<td>VOCs</td>
<td>volatile organic compounds</td>
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<tr>
<td>VTA</td>
<td>Santa Clara Valley Transportation Authority</td>
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<td>WDRs</td>
<td>Waste Discharge Requirements</td>
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<td>Williamson Act</td>
<td>The California Land Conservation Act</td>
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<td>WPCP</td>
<td>Sunnyvale Water Pollution Control Plant</td>
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<tr>
<td>WPF</td>
<td>Water Purification Facilities</td>
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</tbody>
</table>
APPENDIX A
Notice of Preparation and Scoping Comments
NOTICE OF PREPARATION

TO: Responsible, Trustee, and Other Interested Public Agencies; Interested Parties

FROM: City of Sunnyvale
Public Works Department
456 W. Olive Avenue
Sunnyvale, CA 94086
Contact: Craig Mobeck, PE: (408) 730-7415
CMobeck@sunnyvale.ca.gov

SUBJECT: NOTICE OF PREPARATION OF A DRAFT PROGRAM ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED SUNNYVALE WATER POLLUTION CONTROL PLANT (WPCP) MASTER PLAN

Notice is Hereby Given that the City of Sunnyvale (City) will be the lead agency and will prepare a Program Environmental Impact Report (PEIR) for the project identified below in accordance with the provisions of the California Environmental Quality Act (CEQA) Guidelines, Section 15082.

The purpose of this Notice is (1) to serve as the Notice of Preparation to potential Responsible Agencies, agencies involved in funding or approving the project, and Trustee Agencies responsible for natural resources affected by the project, pursuant to Section 15082 of the CEQA Guidelines; and (2) to advise and solicit comments and suggestions regarding the preparation of the PEIR, environmental issues to be addressed in the PEIR, and any related issues, from interested parties in addition to those noted above, including interested or affected members of the public. The City requests that any potential Responsible or Trustee Agency responding to this notice do so in a manner consistent with CEQA Guidelines Section 15082(b).

Due to the time limits mandated by state law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. Please send your response to Craig Mobeck, Assistant Director/City Engineer at the address shown above. We will need the name for a contact person in your agency or from an interested party.

Project Title: Sunnyvale WPCP Master Plan
Review Period: June 15, 2015 through July 15, 2015
Project Description:

**WPCP Master Plan.** The City proposes to approve the Sunnyvale Water Pollution Control Plant Master Plan (Master Plan) for the Donald M. Somers Water Pollution Control Plant (WPCP). The proposed Master Plan will serve as a long-term guide for upgrading and replacing the WPCP’s facilities and operations. The purpose of the Master Plan is to ensure that the WPCP can meet changing regulations, treat existing and projected wastewater flows reliably and cost-effectively, and increase recycled water production. The Master Plan yielded a preferred site plan and a series of capital improvement projects, including replacement of existing and construction of new facilities, to be phased in over the next 20 or more years at and near the WPCP.

**Water Purification Facilities Variant.** The City is also contemplating implementation of a variation of the Master Plan in partnership with the Santa Clara Valley Water District (District) to produce purified water at the WPCP. Implementation of the “Water Purification Facilities” (WPF) would alter the WPCP site layout and some of the treatment processes in order to produce purified water for groundwater recharge at locations south of the WPCP.

**Project Location.** The Master Plan would be implemented at and near the Sunnyvale WPCP, 1444 Borregas Avenue, Sunnyvale CA. The Water Purification Facilities could involve use of existing and development of new facilities at sites in the cities of Sunnyvale, Saratoga, Cupertino, San Jose, Campbell, and Los Gatos.

**Public Scoping Meeting:** The City will hold two Scoping Meetings on June 24, 2015: one from 2:30 to 4:30 p.m. at Las Palmas Park Building (850 Russett Drive, Sunnyvale, CA 94087); and one from 6:30 to 8:30 p.m. at Sunnyvale Community Center Ballroom (550 East Remington Drive, Sunnyvale, CA 94087). The purposes of these meetings are to (1) inform the public and interested agencies about the proposed project; and (2) solicit public comment on the scope of the environmental issues to be addressed in the PEIR.

**A 30-Day NOP Review Period:** In accordance with CEQA, should your agency have any comments, it is requested to provide a written response to this NOP within the 30-day NOP review period between June 15, 2015 and July 15, 2015. Written comments must be received at the address below no later than 4:00 PM on July 15, 2015. Please indicate a contact person in your response and send it to:

Craig Mobeck  
Assistant Director/City Engineer  
City of Sunnyvale, Public Works  
P.O. Box 3707  
Sunnyvale, CA 94088-3707  
CMobeck@sunnyvale.ca.gov  
Telephone: (408) 730-7415
ADDITIONAL PROJECT INFORMATION

ENVIRONMENTAL REVIEW

Type of Environmental Impact Report

Program EIR. The City is preparing a PEIR for the Master Plan consistent with CEQA Guidelines Section 15168. A PEIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related (e.g., related geographically, or as individual activities carried out under the same authorizing authority). The City actions that the PEIR will address are approval of the WPCP Master Plan and endorsement of a site plan for the WPCP that could accommodate Water Purification Facilities, should the City and the Santa Clara Valley Water District (District) choose to pursue that option.

Degree of Specificity. The Program EIR will evaluate the environmental effects that can be expected to follow these approval actions. The level of detail contained in the PEIR will mirror that contained in the Master Plan and the information currently available on proposed Water Purification Facilities. The evaluations in the PEIR will not be as detailed as (for example) those in an EIR on approval of a specific construction project.

Use of the PEIR for Later Activities. When the City considers whether and how to proceed with a particular facility or action identified in the Master Plan, this PEIR can be used to simplify the task of preparing environmental documents on that facility or action through tiering.\(^1\)

Process

The PEIR will be prepared to evaluate the effects of the proposed Master Plan on the environment. A summary of the review process for the proposed Master Plan and the EIR are as follows.

- Scoping of Issues. To determine the topics to be addressed in the Draft PEIR. This includes a 30-day Notice of Preparation public review period and public Scoping Meetings on June 24, 2015.

- Review of Draft PEIR. The Draft PEIR will be circulated for public review and comment for the required 45-day public review period. All individuals who have requested in writing to be notified will be placed on a Notice of Availability list for the Draft PEIR. The Draft PEIR and related materials will be available for review on the City’s website: http://sunnyvale.ca.gov/Departments/PublicWorks/PublicWorksDivisions/Engineering.as

\(^1\) Tiering refers to using the analysis of general matters contained in a broader EIR (in this case, the PEIR) with later CEQA documents on narrower projects, incorporating by reference the general discussions from the broader EIR and focusing the later CEQA document solely on the issues specific to the later project. Refer to CEQA Guidelines Sections 15168(d) and 15152(a).
px, the Sunnyvale Public Library (665 W. Olive Avenue, Sunnyvale, California), and at the City of Sunnyvale, located at 456 W. Olive Avenue, Sunnyvale, California.

- **Future Public Meetings.** Public meetings will be scheduled during the 45-day Draft PEIR comment period. The City will provide notification of future public meetings to individuals who have requested to be included on the project interest list.

- **Responses to Comments.** Following receipt of all written comments on the Draft PEIR, the City of Sunnyvale will prepare Responses to Comments as part of the Final PEIR.

- **Final PEIR.** The Final PEIR will be used by the City as it considers whether to approve the Master Plan. In addition to the City, various governmental agencies may use the PEIR in reviewing, approving and/or permitting various components of the project.

## PROJECT DESCRIPTION

### Background

**Existing WPCP Operations**

The WPCP treats wastewater originating from Sunnyvale, Rancho Rinconada, and Moffett Field, shown in Figures 1 and 2. During dry weather, the WPCP is permitted to treat 29.5 million gallons per day (mgd) of wastewater. The WPCP combines physical, chemical, and natural biological processes to remove pollutants from wastewater and produce effluent that meets or exceeds water quality standards. The WPCP currently employs a series of processes described below to separate and treat liquid and solids streams to meet applicable regulations to protect public health and water quality.

**Preliminary and Primary Treatment.** Preliminary and primary treatment consists of the removal of large debris, grit, and other organic solids from the wastewater through mechanical and chemical means. Large debris is reduced in size and, along with grit, settled from the water during preliminary treatment. Following grit removal, the wastewater undergoes primary treatment in sedimentation basins, where sludge settles to the bottom of the water column and materials such as oil and grease (scum) float to the top. The sludge and scum are removed and the remaining water (primary effluent) flows to the oxidation ponds.

**Secondary Treatment.** Dissolved solids and ammonia are removed from the primary effluent by biological processes in the oxidation ponds and in tanks containing ammonia-consuming bacteria. Algae and other solids are removed from the water by dissolved air flotation, which then undergoes tertiary treatment.

**Tertiary Treatment, Discharge, Recycled Water.** Tertiary treatment consists of filtration of secondary effluent through sand filters followed by disinfection using chlorine or sodium
hypochlorite. Tertiary treatment at the WPCP results in water that is clean enough to meet requirements for discharge to San Francisco Bay via Moffett Slough or to use as recycled water.

**Solids Handling.** Sludge from the treatment processes is pumped to tanks to be digested (and thus rendered inert) by bacteria. To encourage growth of the bacteria, the digesters are warmed by heat generated by on-site engines. The solids removed from the digesters (now called biosolids) are drained and dried prior to being hauled off site.

In addition to these processes, the WPCP includes energy recovery processes and support facilities.

**Need for the Master Plan**

The Master Plan was developed to address several challenges facing the WPCP today and into the future, as well as to support City policies. These challenges include aging infrastructure and operational reliability, regulatory requirements, projected increases in wastewater, and policy decisions regarding energy use and recycled water.

**Master Plan Characteristics**

Over the 20+ years during which the Master Plan would be implemented, many of the existing buildings and processes at the WPCP site would be decommissioned and replaced with new buildings and processes. The Master Plan improvements are described below. Figure 3 depicts the site plan envisioned for the WPCP main plant at build-out of the Master Plan.

**Near-term Rehabilitation of Existing Facilities (2016 to 2020)**

With implementation of the Master Plan, the City is proposing to rehabilitate several existing secondary, tertiary, and support facilities before 2020. The City proposes to permanently close Carl Road to public access west of Borregas Drive and to relocate recreational access to the San Francisco Bay Trail in order to accommodate the proposed improvements to the WPCP and ensure site security. Recreationists would access the Bay Trail and other area trails via an enhanced access point proposed as part of the Master Plan along Caribbean Drive. The City would also construct a new administration building for the WPCP south of Carl Road, at the current location of the Household Hazardous Waste Drop-off Site (to be relocated).

**Long Term Changes in WPCP Operations (2020 to 2035+)**

**Secondary Treatment.** In the long term, the current secondary system (including the oxidation ponds) would be replaced by a different process called conventional activated sludge\(^2\) in order to address changing regulations. Primary effluent would flow to new tanks constructed on the main plant site for treatment by biological processes instead of flowing to the oxidation ponds. The City would also construct facilities within one of the oxidation ponds to provide diurnal equalization and storage for anticipated peak wastewater (primary effluent) flows. After the City

\(^2\) The conventional activated sludge process is a commonly used method to remove the soluble/non-settlesble organic solids from primary effluent with the assistance of microorganisms.
eventually converts the secondary treatment process to conventional activated sludge, the City would decommission the oxidation ponds. The City proposes to explore opportunities to restore habitat within the decommissioned ponds.

**Tertiary Treatment.** A new filter backwash storage facility would also be constructed once the proposed secondary treatment system is replaced and operational. Additional advanced treatment facilities that could be implemented in the future, depending on future regulations and policy decisions regarding recycled water production, include denitrification\(^3\), microfiltration\(^4\), and ozonation\(^5\). Potential future disinfection processes at the WPCP could also include chloramine and ultraviolet disinfection.\(^6\)

**Solids.** New facilities to process biosolids would be built at the WPCP, including a thickening/dewatering facility, potentially an additional digester, and a fat, oils and grease/food waste receiving facility. Based on future biosolids disposal needs, a thermal drying facility may also be implemented in the future.

**Energy.** The City would refurbish the WPCP’s existing power generation facility. In addition, the City would replace the WPCP’s electrical distribution system along with and upgrading the standby power equipment and automation capabilities.

**Support Facilities and Related Actions.** In addition to the new administration facility, the City would construct a new maintenance facility and change vehicular circulation and access through the Plant. A floodwall would be constructed around the perimeter of the WPCP to provide protection from tidal flooding.

**Construction Phasing and Future Facility Operations**

Construction activities, including site preparation, facility construction, decommissioning, and demolition, would be phased throughout the Master Plan planning period (through year 2035). WPCP operations would continue 365 days per year, 24 hours per day.

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\(^3\) Denitrification is a process used to remove nitrogen from wastewater. Denitrification occurs under anoxic conditions (water that is depleted of dissolved oxygen) and involves the biological conversion of nitrate into nitrogen gas.

\(^4\) Microfiltration is a membrane-based low-pressure separation process that typically employs hollow fiber membranes to provide a barrier to the passage of solids (such as turbidity and suspended solids) and microorganisms (such as bacteria, pathogens and some viruses).

\(^5\) Ozonation is a disinfection process within a contact chamber that uses ozone gas to inactivate or destroy pathogenic organisms and to oxidize odor-causing compounds. The off-gases from the contact chamber are treated to destroy residual ozone before release into the atmosphere.

\(^6\) Chloramine is a disinfectant added to water for public health protection. It is a combination of chlorine and ammonia that is considered particularly effective at controlling the formation of certain regulated organic disinfection byproducts. Ultraviolet disinfection is a physical (rather than chemical) process used to inactivate or destroy pathogenic organisms. Ultraviolet disinfection systems transfer electromagnetic energy from a mercury arc lamp to an organism’s genetic material, thereby destroying a cell’s ability to reproduce.
Water Purification Facilities Variant

The City has entered into agreements with the District to consider increasing the production and distribution of recycled and purified water in Sunnyvale and other parts of Santa Clara County. Through these agreements, the City and the District are proposing a variation of the Master Plan, the Water Purification Facilities (WPF) variant, to produce purified water at the WPCP. The purpose of the proposed WPF is to augment potable water supplies in the Santa Clara Valley.

Need for the Variant

The proposed WPF would address the challenges and management decisions associated with the Master Plan through different improvements to secondary and tertiary treatment processes (e.g., implementation of membrane bioreactors [MBRs]\(^7\) instead of conventional activated sludge and filter facilities) while also addressing the major water supply constraints facing the City and rest of the Santa Clara Valley. The District needs additional supplies to fill projected future water supply shortfalls. Purified water produced from treated wastewater is a locally-developed and reliable water supply that can be used to supplement raw water used for groundwater recharge. Provided through proven technologies, purified water is a drought-proof supply that can help ensure Santa Clara County has safe sustainable water now and into the future.

Water Purification Processes at the WPCP

Construction and operation of MBRs, a reverse osmosis facility (RO)\(^8\), an ultraviolet disinfection plus advanced oxidation\(^9\) facility, and related facilities would occur at the WPCP. These facilities would produce purified water and RO concentrate (a byproduct of the RO process). Improvements at the WPCP needed to accommodate the WPF would also include upgrades to the electrical distribution system equipment to be installed as part of the Master Plan.

Water Purification Processes Outside the WPCP

Components of the WPF outside of the WPCP include the following: (1) use of the purified water by the District to recharge the groundwater basin via injection wells or recharge basins (the use of purified water for groundwater recharge with the intent of augmenting drinking water supplies is referred to as indirect potable reuse [IPR]); (2) repurpose existing pipelines or construct new pipelines to convey the purified water to the injection wells and recharge basins; and (3) management of RO Concentrate by either discharging it into a created wetland, conveying it to

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\(^7\) MBRs are a combination of activated sludge reactors and membrane systems. Membrane systems are pressure driven solids separation processes, which use membranes with extremely small pore spaces to remove particles. The membrane system would replace the function of the secondary clarifiers and deep bed filters that would be required if conventional activated sludge facilities were implemented.

\(^8\) RO is a process in which dissolved inorganic solids (such as salts) are removed from a solution (such as water). This is accomplished by pushing the water through a semi-permeable membrane: pressure is exerted on the side with the concentrated solution to force the water molecules across the membrane. The membrane allows the water to pass through while capturing the impurities or contaminants. The RO process produces product water or permeate (purified water) and RO concentrate (also referred to as brine).

\(^9\) Advanced oxidation involves addition of an oxidant to the effluent upstream of the ultraviolet reactors.
the East Bay Discharger’s Authority pipeline for discharge into the San Francisco Bay, or blending with the WPCP’s remaining effluent and discharging via the existing outfall.

**Construction Phasing and Future Facility Operations**

Construction of proposed improvements at the WPCP would involve the same type of construction activities and equipment as described for the Master Plan. Construction for proposed improvements outside of the WPCP could involve grading, demolition, drilling, and trenching. The small site of the WPCP drives the phasing: some facilities must be decommissioned and demolished before there is space to construct new facilities, while the WPCP maintains operations 24 hours per day. The WPF would change the overall schedule and phasing for the Master Plan. For example, construction of the diurnal equalization and emergency storage would occur 10 years sooner. Once constructed, the WPF are assumed to operate 365 days per year, 24 hours per day.

**PROJECT LOCATION**

The WPCP includes the main plant and two oxidation ponds10 (see Figure 2). The main plant occupies an approximately 16.6-acre site at 1444 Borregas Avenue in Sunnyvale, Santa Clara County, and is accessed via Carl Road. The WPCP is adjacent to the southern end of San Francisco Bay and includes 440 acres of oxidation ponds (Ponds 1 and 2) along the Bay margin, as shown on Figure 2.

The Water Purification Facilities would be located at the WPCP and at locations south of the WPCP that would be determined during planning and design. Recharge ponds within the existing Los Gatos Groundwater Recharge System are located within the City of Campbell and Town of Los Gatos. Injection wells could be sited in Saratoga, San Jose, and Campbell. Pipeline alignments between the WPCP, the injection well siting area, and the recharge ponds could be located in the cities of Sunnyvale, San Jose, Campbell, Cupertino, Saratoga, Santa Clara, and Los Gatos. Refer to Figure 4.

**SUMMARY OF KEY ISSUES TO BE ADDRESSED IN ENVIRONMENTAL IMPACT REPORT**

The PEIR will describe the existing environmental conditions at the WPCP site and will identify the significant environmental impacts anticipated to result from development of the proposed Master Plan. Where potentially significant environmental impacts are identified, the PEIR will also identify mitigation measures that may make it possible to avoid or reduce significant impacts. The analysis in the PEIR will include the following specific categories of environmental impacts and concerns related to the proposed project. Additional subjects may be added at a later date, as new information comes to light.

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10 Bodies of wastewater that promote the growth of algae and microorganisms, which consume solids and nutrients.
The WPF represents a variation of the Master Plan. The PEIR will indicate how impacts associated with implementing the Master Plan would differ if the City and the District pursue implementation of the WPF.

**Land Use and Recreation**

The PEIR will identify the land uses on and around the WPCP site, and evaluate potential land use impacts, including the project’s compatibility with existing land use surrounding the project area, as well conformance with any applicable land use plan, policy, or regulations. The implementation of the proposed Master Plan would include relocation of an existing San Francisco Bay Trail access point. The PEIR will describe existing recreation facilities at and surrounding the WPCP site and evaluate the potential impacts that could result from the changes to the recreational facilities.

The above issues will also be evaluated for the WPF, to the extent that WPF features have been defined.

**Transportation**

Implementation of Master Plan would involve construction and operation of proposed facilities, which could change traffic and circulation within the project area. The PEIR will identify whether construction and implementation of the Master Plan would conflict with an applicable plan, ordinance or policy for circulation patterns, transit systems, and bicycle and pedestrian facilities in and around the WPCP, including the City of Sunnyvale General Plan and the Santa Clara County Congestion Management Agency. The PEIR will also discuss potential traffic hazards impacts to that could result from project design features or inadequate emergency access.

The above issues will also be evaluated for the WPF, to the extent that WPF features have been defined.

**Air Quality**

The PEIR will describe the existing local and regional air quality conditions in the Bay Area and will discuss the effects of project implementation on air quality, including criteria air pollutants, toxic air contaminants, and odors. The PEIR will describe the potential for exposure of sensitive receptors to substantial pollutant concentrations and odors.

The above issue will also be evaluated for the WPF, to the extent that WPF features have been defined.

**Greenhouse Gases and Global Climate Change**

The PEIR will examine potential greenhouse gas emissions impacts that could result from the implementation of the Master Plan.
The above issue will also be evaluated for the WPF, to the extent that WPF features have been defined.

**Noise**

Implementation of the Master Plan could result in changes the existing noise environment. The PEIR will describe the existing setting and the noise levels associated with the construction and operation of proposed facilities. The noise analysis will discuss exposure of people to noise or vibration levels in excess of standards. The noise analysis will determine whether the ambient noise levels at the WPCP are compatible with adjacent land uses. The potential for implementation of the Master Plan to increase ambient noise levels in the project vicinity will also be analyzed.

The above issues will also be evaluated for the WPF, to the extent that WPF features have been defined.

**Biological Resources**

The WPCP occupies a developed site adjacent to, and discharges treated effluent into the San Francisco Bay. Sensitive habitat within and outside of the Don Edwards National Wildlife abuts the WPCP boundaries. The PEIR will include a description of the existing biological setting and a discussion of potential impacts to biological resources such as sensitive habitats and special-status species. Implementation of the Master Plan would involve decommissioning of Ponds 1 and 2 and potential habitat restoration opportunities.

The above issues will also be evaluated for the WPF, to the extent that WPF features have been defined.

**Hydrology and Water Quality**

Implementation of the Master Plan will involve construction of a flood control wall. The PEIR will discuss the drainage conditions in the project area and the potential for flooding at the WPCP. The PEIR will also discuss the potential for project construction to contribute to runoff water or alter the drainage pattern of the WPCP site.

The California Regional Water Quality Control Board (RWQCB), San Francisco Region, regulates the WPCP’s discharges into the San Francisco Bay through National Pollution Discharge Elimination System (NPDES) regulations of the Clean Water Act. The NPDES permit for the WPCP (NPDES Permit No. CA0037621, currently implemented as Order No. R2-2014-0035) documents current practices and levels of service for attainment of discharge water quality that is protective of beneficial uses. The proposed Master Plan is in part driven by anticipated future changes in regulations governing the WPCP’s discharges. The PEIR will discuss the proposed project in light of existing and expected changes in discharge limitations for the WPCP. Implementation of the Master Plan facilities could also change the quality of runoff water at the WPCP site. The PEIR will identify potential water quality impacts that could result from the
implementation of the Master Plan and will address the applicable waste discharge 
requirements. Conformance with the Santa Clara Valley Urban Runoff Pollution Prevention 
Program as well as other RWQCB requirements will also be addressed.

The above issues will also be evaluated for the WPF, to the extent that WPF features have 
been defined. Evaluation of the WPF will include qualitative discussions of regulatory 
requirements and the potential for adverse water quality impacts to result from injection or 
passive recharge of purified water into the groundwater basin as well as management of 
reverse osmosis concentrate (a byproduct of the reverse osmosis process).

Geology and Soils

Implementation of the Master Plan would place new structures within a seismically active 
region. The PEIR will identify the existing geologic and soil conditions on the WPCP site. 
Potential impacts to be discussed include seismic hazards and/or increased exposure of 
structures to seismic hazards related to ground-shaking in the event of an earthquake, exposure 
of structures to geologic hazards (such as liquefaction, poor soil conditions, or unstable slopes), 
and soil erosion.

The above issues will also be evaluated for the WPF, to the extent that WPF features have 
been defined.

Hazardous Materials

Master Plan implementation could result in changes in water treatment chemical usage. The 
PEIR will identify potential impacts that could result in hazards to the public or the environment 
through routine handling or accidental upset of hazardous materials. The PEIR will also identify 
the potential for soil and groundwater contamination from existing and previous uses at the 
project site.

The above issues will also be evaluated for the WPF, to the extent that WPF features have 
been defined.

Cultural Resources

The PEIR will identify the potential for historic, archaeological and paleontological resources to 
be present on the WPCP, and the project’s potential impacts on those resources.

The above issues will also be evaluated for the WPF, to the extent that WPF features have 
been defined.

Public Services, Utilities and Service Systems

The PEIR will identify the potential for the construction and implementation of the Master Plan to 
increase the demand for public services, such as police, fire, and medical services. The 
proposed project is the adoption of a wastewater treatment plant master plan. The PEIR will
identify potential effects on utilities and service systems that could result from implementation of the Master Plan.

The above issues will also be evaluated for the WPF, to the extent that WPF features have been defined.

**Visual Resources**

The PEIR will also discuss the visual and aesthetic resources of the WPCP and its surroundings and potential impacts on scenic vistas and scenic resources that could result from implementation of the Master Plan.

The above issues will also be evaluated for the WPF, to the extent that WPF features have been defined.

**Energy**

Implementation of the Master Plan would result in improvements to facilities associated with power generation, waste heat use, standby power, and power distribution. The PEIR will address the potential energy-related impacts that could result from implementation of the Master Plan, including the potential for increase in overall energy consumption.

The above issues will also be evaluated for the WPF, to the extent that WPF features have been defined.

**Alternatives to the Project**

The PEIR will identify and evaluate feasible alternatives to the proposed project that might reasonably be assumed to reduce significant impacts, and will include a "No Project" alternative.

**Cumulative Impacts**

The PEIR will identify environmental impacts of the Master Plan and WPF that may be individually limited but cumulatively considerable (meaning that the incremental effects of the Master Plan are significant when viewed in connection with the effects of other projects).

**Other Required Sections**

The PEIR will also include other information typically required for an EIR. These other sections include the following: 1) Growth Inducing Impacts; 2) Significant, Unavoidable Impacts; 3) Significant Irreversible Environmental Changes; 4) References; and 5) PEIR Authors. Relevant technical reports will be provided as technical appendices.
Attachments:

Figure 1, Site Location Map
Figure 2, Sunnyvale Water Pollution Control Plant Area Map
Figure 3, Proposed Master Plan Layout
Figure 4, Water Purification Facilities Location
Figure 1
Site Location Map

SUNNYVALE WATER POLLUTION CONTROL PLANT

SOURCE: Thomas Brothers; ESA
LEGEND
- WPCP Property
- Sunnyvale City Boundary
- Don Edwards National Wildlife Refuge

Figure 2
Sunnyvale Water Pollution Control Plant Area Map

SOURCE: H.T. Harvey & Associates; adapted by ESA
Figure 3

Proposed Master Plan Layout

SOURCE: ESA, Carollo Engineers

For proposed changes to Oxidation Ponds, see Figures 3-6 and 3-7.

NOTE: Layout depicts buildout of Master Plan at the main plant site.
For Split Flow Process, aeration basins, secondary clarifiers, and related structures would be implemented in stages.
Figure 4

Water Purification Facilities Location

SOURCE: Google Maps; SCVWD; ESA
Notice of Preparation

June 15, 2015

To: Reviewing Agencies
Re: Sunnyvale Water Pollution Control Plant Master Plan SCH# 2015062037

Attached for your review and comment is the Notice of Preparation (NOP) for the Sunnyvale Water Pollution Control Plant Master Plan draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Craig Mobeck
City of Sunnyvale
PO Box 9707
Sunnyvale, CA 94088

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments

cc: Lead Agency
Document Details Report  
State Clearinghouse Data Base

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**Lead Agency Contact**

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<th>Name</th>
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**Project Location**

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**Project Issues**

- Aesthetic/Visual
- Air Quality
- Archaeologic-Historic
- Biological Resources
- Coastal Zone
- Flood
- Plain/Flooding
- Geologic/Seismic
- Minerals
- Noise
- Population/Housing Balance
- Public Services
- Recreation/Parks
- Schools/Universities
- Sewer Capacity
- Soil Erosion/Compaction/Grading
- Traffic/Circulation
- Water Quality
- Water Supply
- Wetland/Riparian
- Landuse
- Cumulative Effects

**Reviewing Agencies**

- Regional Water Quality Control Board, Region 1
- Department of Parks and Recreation
- San Francisco Bay Conservation and Development Commission
- Department of Water Resources
- Department of Fish and Wildlife, Region 3
- Native American Heritage Commission
- California Highway Patrol
- Caltrans, District 4
- Air Resources Board
- State Water Resources Control Board, Division of Financial Assistance
- Regional Water Quality Control Board, Region 2

**Date Received** 06/15/2015  
**Start of Review** 06/15/2015  
**End of Review** 07/14/2015

Note: Blanks in data fields result from insufficient information provided by lead agency.
Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

Project Title: Sunnyvale Water Pollution Control Plant Master Plan
Lead Agency: City of Sunnyvale
Mailing Address: P.O. Box 3707
City: Sunnyvale
Zip: 94088
County: Santa Clara

Project Location: County: Santa Clara
City/Nearest Community: Sunnyvale
Cross Streets: Carl Road and Borregas Ave.
Zip Code: 94089

Assessor’s Parcel No.: 110-03-023, 110-03-064
Within 2 Miles: State Hwy #: 237, 101, 17, 85
Airports: Moffett Airfield
Railways: Santa Clara Light Rail
Schools: See attached

Document Type:
 CEQA: X NOP

Local Action Type:
□ General Plan Update
□ General Plan Amendment
□ General Plan Element
□ Community Plan
□ Specific Plan
□ Rezone
□ Prezone
□ Use Permit
□ Land Division (Subdivision, etc.)
□ Master Plan
□ Planned Unit Development
□ Site Plan
□ Annexation
□ Redevelopment
□ Coastal Permit
□ Other:

Development Type:
□ Residential: Units Acres
□ Office: Sq. ft. Acres
□ Commercial: Sq. ft. Acres
□ Industrial: Sq. ft. Acres
□ Educational:
□ Recreational:
□ Water Facilities/Type MGD
□ Transportation: Type
□ Mining: Mineral
□ Power: Type
□ Waste Treatment: Type
□ Hazardous Waste: Type
□ Other:

Project Issues Discussed in Document:
□ Aesthetic/Visual
□ Agriculture Land
□ Air Quality
□ Archeological/Historical
□ Biological Resources
□ Coastal Zone
□ Drainage/Absorption
□ Economic/Jobs
□ Fiscal
□ Flood Plain/Flooding
□ Geologic/Seismic
□ Minerals
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□ Public Services/Facilities
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□ Soil Erosion/Compaction/Grading
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□ Toxic/Hazardous
□ Traffic/Circulation
□ Vegetation
□ Water Quality
□ Water Supply/Groundwater
□ Wetland/Riparian
□ Growth Inducement
□ Land Use
□ Cumulative Effects
□ Other:

Present Land Use/Zoning/General Plan Designation:
See attached

Project Description: (please use a separate page if necessary)
Includes improvements at the WPCP and south of the WPCP. See attached for additional project description information.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.  

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**Last Updated 3/17/2015**
July 15, 2015

City of Sunnyvale
Public Works Department
456 W. Olive Avenue
Sunnyvale, CA 94086
Contact: Craig Mobeck, PE: (408) 730-7415
CMobeck@sunnyvale.ca.gov

RE: NOTICE OF PREPARATION OF A DRAFT PROGRAM ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED SUNNYVALE WATER POLLUTION CONTROL PLANT (WPCP) MASTER PLAN

Dear Mr. Mobeck:

The County of Santa Clara Department of Environmental Health (DEH) received a Notification of Preparation (NOP) from the City of Sunnyvale that an EIR is being prepared for the above project and was requested to provide input on the scope of environmental issues to be addressed.

Our Department has been designated by California's Department of Resources Recycling and Recovery (CalRecycle) as the Local Enforcement Agency (LEA) to oversee solid waste facilities per Title 14 and Title 27 of the California Code of Regulations. These regulations for closed landfills were basically promulgated with the idea of minimal use of the closed landfill along the lines of non-irrigated open space.

We wish to suggest that mention of the disposition of Class B treated sludge at the 7-acre Sunnyvale Biosolids Monofill (SBM) site adjacent to the City of Sunnyvale Closed Landfill, which is directly across the project area, be included in the document paragraph regarding Solids Handling under Project Description.

Operations of monofilling biosolids at this site started in 1996. The site, with a capacity of approximately 40,000 cubic yards, was expected to provide eight to ten years of capacity predicated on a fill rate of 4,000 to 5,000 cubic yards per year. In 2004, the SBM was determined
to meet the criteria pursuant to California Code of Regulations (CCR) Title 17, section 18215 and was exempt from requirement for a Solid Waste Facility Permit (SWFP). Section 18215 of CCR states that a Solid Waste Facility Permit exemption may be granted by the Local Enforcement Agency (LEA). The SBM falls under the classification found in CCR, Title 17, section 18215 (b) (7) which states exempted disposal sites may include wastewater treatment sludge if disposed of onsite or to specified agricultural lands.

The exemption was not intended to preclude the SBM from future regulation based upon CalRecycle determination or statutory regulation and does not affect the need to comply with all other applicable federal, state and local requirements. The exemption was also not intended to preclude the LEA from accepting application for a solid waste facilities permit if specific local concerns exist which can be addressed only through the issuance of a solid waste facilities permit.

The LEA, CalRecycle, Bay Area Air Quality Control Board (BAAQMD) and the Regional Water Quality Control Board (RWQCB) are Responsible Agencies for this project. The City, as lead agency, should consider all the concerns and comments to allow proper project evaluation. Please send to us any Initial Studies, Draft and Final EIR, or any supporting documentation for this project.

We appreciate the opportunity to provide input and comment on the scope of environmental analysis.

If you have any questions, please feel free to contact me at (408) 918-3405. I can also be reached at jaji.murage@deh.sccgov.org

Sincerely,

Jaji Murage
Registered Environmental Health Specialist
Solid Waste Programs
Hazardous Materials Compliance Division
Department of Environmental Health

Cc: Alfred Worcester, Calrecycle, Alfred.worcester@calrecycle.ca.gov
    Devender Narala, RWQCB, Devender.narala@waterboards.ca.gov
July 14, 2015

Mr. Craig Mobeck  
Planning Division  
City of Sunnyvale  
456 W. Olive Avenue  
Sunnyvale, CA 94086

Dear Mr. Mobeck:

Sunnyvale Water Pollution Control Plant Master Plan - Notice of Preparation (NOP)

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the project referenced above. The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. The Caltrans District 4 Local Development-Intergovernmental Review (LD-IGR) Program reviewed the NOP to ensure consistency with our mission and state planning priorities of infill, conservationism, and efficient development. Please also refer to our previous comment letter on the Sunnyvale Water Pollution Control Primary Treatment Facility Mitigated Negative Declaration (Statehouse Clearing No.: 2014112037, Caltrans District 4 LD-IGR File No.: SCL237208), dated December 16, 2014. We provide these comments consistent with the State's smart mobility goals to support a vibrant economy and build communities, not sprawl.

Project Understanding  
The proposed project would serve as a long-term guide for upgrading and replacing the Sunnyvale Water Pollution Control Plant's (Plant) facilities and operations. The purpose of the Master Plan is to ensure that the Plant can meet changing regulations, treat existing and projected wastewater flows reliably and cost-effectively, and increase recycled water production.

Lead Agency  
As the lead agency, the City of Sunnyvale (City) is responsible for all project mitigation, including any needed improvements to State highways. The project’s fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.
Traffic Control Plan (TCP)
A Caltrans-approved TCP is required to avoid project-related impacts to the State Highway System, and must comply with the requirements of corresponding jurisdictions. In addition, pedestrian access through the construction zone must be in accordance with the Americans with Disabilities Act (ADA) regulations (see Caltrans' Temporary Pedestrian Facilities Handbook for maintaining pedestrian access and meeting ADA requirements during construction at: http://www.dot.ca.gov/hq/construc/safety/Temporary_Pedestrian_Facilities_Handbook.pdf) (see also, Caltrans' Traffic Operations Policy Directive 11-01 "Accommodating Bicyclists in Temporary Traffic Control Zones" at: http://www.dot.ca.gov/hq/traffops/policy/11-01.pdf).

For further TCP assistance, please contact the Caltrans District 4 Office of Traffic Management Operations at (510) 286-4579. Further traffic management information is available at the following website: http://www.dot.ca.gov/hq/traffops/trafmgmt/tmp_lcs/index.htm.

Hazardous Materials
All motor carriers and drivers involved in transportation of hazardous materials must comply with the requirements contained in federal and State regulations, and must apply for and obtain a hazardous materials transportation license from the California Highway Patrol (CHP). When transporting certain types of hazardous materials including inhalation hazards, safe routing and safe stopping places are required. A route map must be carried in the vehicle. More information is available on the CHP website: http://www.chp.ca.gov/publications/#hazmat.

Transportation Permit
Project work that requires movement of oversized or excessive load vehicles on State roadways requires a transportation permit that is issued by Caltrans. To apply, a completed transportation permit application with the determined specific route(s) for the shipper to follow from origin to destination must be submitted to: David Salladay, District Office Chief, Office of Permits, California Department of Transportation, District 4, P.O. Box 23660, Oakland, CA 94623-0660. See the following website for more information: http://www.dot.ca.gov/hq/traffops/permits.

Should you have any questions regarding this letter, please contact Brian Ashurst at (510) 286-5505 or brian.ashurst@dot.ca.gov.

Sincerely,

PATRICIA MAURICE
District Branch Chief
Local Development - Intergovernmental Review

c: Scott Morgan, State Clearinghouse

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability."
State Water Resources Control Board

JUN 24 2015

Craig Mobeck
City of Sunnyvale
PO Box 9707
Sunnyvale, CA 94088

Dear Mr. Mobeck:

NOTICE OF PREPARATION (NOP) FOR CITY OF SUNNYVALE (CITY); SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN (PROJECT); SANTA CLARA COUNTY; STATE CLEARINGHOUSE NO. 2015062037

We understand that the City may be pursuing Clean Water State Revolving Fund (CWSRF) financing for this Project. As a funding agency and a state agency with jurisdiction by law to preserve, enhance, and restore the quality of California’s water resources, the State Water Resources Control Board (State Water Board) is providing the following information on the preparation of the California Environmental Quality Act (CEQA) for the Project.

The State Water Board, Division of Financial Assistance, is responsible for administering the CWSRF Program. The primary purpose for the CWSRF Program is to implement the Clean Water Act and various state laws by providing financial assistance for wastewater treatment facilities necessary to prevent water pollution, recycle water, correct nonpoint source and storm drainage pollution problems, provide for estuary enhancement, and thereby protect and promote health, safety and welfare of the inhabitants of the state. The CWSRF Program provides low-interest funding equal to one-half of the most recent State General Obligation Bond Rates with a 30-year term. Applications are accepted and processed continuously. Please refer to the State Water Board’s CWSRF website at:


The CWSRF Program is partially funded by the United States Environmental Protection Agency and requires additional “CEQA-Plus” environmental documentation and review. Three enclosures are included that further explain the CWSRF Program environmental review process and the additional federal requirements. For the complete environmental application package, please visit:

http://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/srf_forms.shtml. The State Water Board is required to consult directly with agencies responsible for implementing federal environmental laws and regulations. Any environmental issues raised by federal agencies or their representatives will need to be resolved prior to State Water Board approval of a CWSRF financing commitment for the proposed Project. For further information on the CWSRF Program, please contact Mr. Ahmad Kashkoli, at (916) 341-5855.
It is important to note that prior to a CWSRF financing commitment, projects are subject to provisions of the Federal Endangered Species Act (ESA), and must obtain Section 7 clearance from the United States Department of the Interior, Fish and Wildlife Service (USFWS), and/or the United States Department of Commerce National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) for any potential effects to special-status species.

Please be advised that the State Water Board will consult with the USFWS, and/or the NMFS regarding all federal special-status species that the Project has the potential to impact if the Project is to be financed by the CWSRF Program. The City will need to identify whether the Project will involve any direct effects from construction activities, or indirect effects such as growth inducement, that may affect federally listed threatened, endangered, or candidate species that are known, or have a potential to occur in the Project site, in the surrounding areas, or in the service area, and to identify applicable conservation measures to reduce such effects.

In addition, CWSRF projects must comply with federal laws pertaining to cultural resources, specifically Section 106 of the National Historic Preservation Act (Section 106). The State Water Board has responsibility for ensuring compliance with Section 106 and the State Water Board must consult directly with the California State Historic Preservation Officer (SHPO). SHPO consultation is initiated when sufficient information is provided by the CWSRF applicant. The City must retain a consultant that meets the Secretary of the Interior's Professional Qualifications Standards (http://www.nps.gov/history/local-law/arch_stnds_9.htm) to prepare a Section 106 compliance report.

Note that the City will need to identify the Area of Potential Effects (APE), including construction and staging areas, and the depth of any excavation. The APE is three-dimensional and includes all areas that may be affected by the Project. The APE includes the surface area and extends below ground to the depth of any Project excavations. The records search request should extend to a ½-mile beyond Project APE. The appropriate area varies for different projects but should be drawn large enough to provide information on what types of sites may exist in the vicinity.

Other federal environmental requirements pertinent to the Project under the CWSRF Program include the following (for a complete list of all environmental requirements please visit:

A. Compliance with the Federal Clean Air Act: (a) Provide air quality studies that may have been done for the Project; and (b) if the Project is in a nonattainment area or attainment area subject to a maintenance plan; (i) provide a summary of the estimated emissions (in tons per year) that are expected from both the construction and operation of the Project for each federal criteria pollutant in a nonattainment or maintenance area, and indicate if the nonattainment designation is moderate, serious, or severe (if applicable); (ii) if emissions are above the federal de minimis levels, but the Project is sized to meet only the needs of current population projections that are used in the approved State Implementation Plan for air quality, quantitatively indicate how the proposed capacity increase was calculated using population projections.

B. Compliance with the Coastal Zone Management Act: Identify whether the Project is within a coastal zone and the status of any coordination with the California Coastal Commission.
C. Protection of Wetlands: Identify any portion of the proposed Project area that should be evaluated for wetlands or United States waters delineation by the United States Army Corps of Engineers (USACE), or requires a permit from the USACE, and identify the status of coordination with the USACE.

D. Compliance with the Farmland Protection Policy Act: Identify whether the Project will result in the conversion of farmland. State the status of farmland (Prime, Unique, or Local and Statewide Importance) in the Project area and determine if this area is under a Williamson Act Contract.

E. Compliance with the Migratory Bird Treaty Act: List any birds protected under this act that may be impacted by the Project and identify conservation measures to minimize impacts.

F. Compliance with the Flood Plain Management Act: Identify whether or not the Project is in a Flood Management Zone and include a copy of the Federal Emergency Management Agency flood zone maps for the area.

G. Compliance with the Wild and Scenic Rivers Act: Identify whether or not any Wild and Scenic Rivers would be potentially impacted by the Project and include conservation measures to minimize such impacts.

Following the preparation of the draft CEQA document for the Project, please provide us a copy of the document to review if the City is considering CWSRF financing. In addition, we would appreciate notices of any hearings or meetings held regarding environmental review for the Project.

Thank you for providing us a copy of your NOP, and for the consideration of the CWSRF for the financing of the City’s Project. If you have any questions or concerns, please feel free to contact me at (916) 341-5855, or by email at Ahmad.Kashkoli@waterboards.ca.gov, or contact Elyser Naja at (916) 327-9117, or by email at Elyser.Naja@waterboards.ca.gov.

Sincerely,

Carol Eats

Ahmad Kashkoli
Senior Environmental Scientist

cc: State Clearinghouse
(Re: SCH# 2015062037)
P.O. Box 3044
Sacramento, CA 95812-3044
CLEAN WATER STATE REVOLVING FUND

Basic Criteria for Cultural Resources Report Preparation

State Water Resources Control Board
Division of Financial Assistance

For Section 106 Consultation with the State Historic Preservation Officer (SHPO) under the National Historic Preservation Act

CULTURAL RESOURCES REPORT

The Cultural Resources Report must be prepared by a qualified researcher that meets the Secretary of the Interior's Professional Qualifications Standards. Please see the Professional Qualifications Standards at the following website:

http://www.cr.nps.gov/local-law/arch_stnds_9.htm

The Cultural Resources Report should include one of the four “findings” listed in Section 106. These include:

“**No historic properties affected**”
(no properties are within the area of potential effect (APE; including below the ground).

“**No effect to historic properties**”
(properties may be near the APE, but the project will not have any adverse effects).

“**No adverse effect to historic properties**”
(the project may affect “historic properties”, but the effects will not be adverse).

“**Adverse effect to historic properties**”
Note: Consultation with the SHPO will be required if a “no adverse effect to historic properties” or an “adverse effect to historic properties” determination is made, to develop and evaluate alternatives or modifications to the proposed project that could avoid, minimize or mitigate adverse effects on “historic properties.”

RECORDS SEARCH

- A records search (less than one year old) extending to a half-mile beyond the project APE from a geographically appropriate Information Center is required. The records search should include maps that show all recorded sites and surveys in relation to the APE for the proposed project, and copies of the confidential site records included as an appendix to the Cultural Resources Report.

- The APE is three-dimensional (depth, length and width) and all areas (e.g., new construction, easements, staging areas, and access roads) directly affected by the proposed project.
NATIVE AMERICAN and INTERESTED PARTY CONSULTATION

- Native American and interested party consultation should be initiated at the planning phase of the proposed project to gather information to assist with the preparation of an adequate Cultural Resources Report.

- The Native American Heritage Commission (NAHC) must be contacted to obtain documentation of a search of the Sacred Lands Files for or near the project APE.

- All local Native American tribal organizations or individuals identified by the NAHC must be contacted by certified mail, and the letter should include a map and a description of the proposed project.

- Follow-up contact should be made by telephone and a phone log maintained to document the contacts and responses.

- Letters of inquiry seeking historical information on the project area and local vicinity should be sent to local historical societies, preservation organizations, or individual members of the public with a demonstrated interest in the proposed project.

Copies of all documents mentioned above (project description, map, phone log and letters sent to the NAHC and Native American tribal organizations or individuals and interested parties) must be included in the Cultural Resources Report.

PRECAUTIONS

A finding of "no known resources" without supporting evidence is unacceptable. The Cultural Resources Report must identify resources within the APE or demonstrate with sufficient evidence that none are present.

"The area is sensitive for buried archaeological resources," followed by a statement that "monitoring is recommended." Monitoring is not an acceptable option without good-faith effort to demonstrate that no known resource is present.

If "the area is already disturbed by previous construction" documentation is still required to demonstrate that the proposed project will not affect "historic properties." An existing road can be protecting a buried archaeological deposit or may itself be a "historic property." Additionally, previous construction may have impacted an archaeological site that has not been previously documented.

SHPO CONSULTATION LETTER

Submit a draft consultation letter prepared by the qualified researcher with the Cultural Resources Report to the State Water Resources Control Board. A draft consultation letter template is available for download on the State Water Board webpage at: http://www.waterboards.ca.gov/water_issues/programs/grants_loans/cwsrf_requirements.shtml

Contact Information: For more information related to the CWSRF Program Cultural Resources and Requirements, please contact Mr. Ahmad Kashkoli at 916-341-5855 or Ahmad.Kashkoli@waterboards.ca.gov
CLEAN WATER STATE REVOLVING FUND

California Environmental Quality Act Requirements

The State Water Resources Control Board (State Water Board), Division of Financial Assistance, administers the Clean Water State Revolving Fund (CWSRF) Program. The CWSRF Program is partially funded by grants from the United States Environmental Protection Agency. All applicants seeking CWSRF financing must comply with the California Environmental Quality Act (CEQA), and provide sufficient information so that the State Water Board can document compliance with federal environmental laws. The "Environmental Package" provides the forms and instructions needed to complete the environmental review requirements for CWSRF Program financing. It is available at:

http://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/srf_forms.shtml

LEAD AGENCY
The applicant is usually the "Lead Agency" and must prepare and circulate an environmental document before approving a project. Only a public agency, such as a local, regional or state government, may be the "Lead Agency" under CEQA. If a project will be completed by a non-governmental organization, "Lead Agency" responsibility goes to the first public agency providing discretionary approval for the project.

RESPONSIBLE AGENCY
The State Water Board is generally a "Responsible Agency" under CEQA. As a "Responsible Agency," the State Water Board must make findings based on information provided by the "Lead Agency" before financing a project.

ENVIRONMENTAL REVIEW
The State Water Board's environmental review of the project's compliance with both CEQA and federal cross-cutting regulations must be completed before a project can be financed by the CWSRF Program.

DOCUMENT REVIEW
Applicants are encouraged to consult with State Water Board staff early during preparation of CEQA document if considering CWSRF financing. Applicants shall also send their environmental documents to the State Water Board, Environmental Review Unit during the CEQA public review period. This way, any environmental concerns can be addressed early in the process.

REQUIRED DOCUMENTS
The Environmental Review Unit requires the documents listed below to make findings and complete its environmental review. Once the State Water Board receives all the required documents and makes its own findings, the environmental review for the project will be complete.

✓ Draft and Final Environmental Documents: Environmental Impact Report, Negative Declaration, and Mitigated Negative Declaration as appropriate to the project
✓ Resolution adopting/certifying the environmental document, making CEQA findings, and approving the project
✓ All comments received during the public review period and the "Lead Agency's" responses to those comments
✓ Adopted Mitigation Monitoring and Reporting Plan, if applicable
✓ Date-stamped copy of the Notice of Determination or Notice of Exemption filed with the County Clerk(s) and the Governor's Office of Planning and Research
✓ CWSRF Evaluation Form for Environmental Review and Federal Coordination with supporting documents

Contact Information: For more information related to the CWSRF Program environmental review process and requirements, please contact your State Water Board Project Manager or Mr. Ahmad Kashkoli at 916-341-5855 or Ahmad.Kashkoli@waterboards.ca.gov

We've got the green... to keep California's water clean.
CLEAN WATER STATE REVOLVING FUND

waterboards.ca.gov
July 7, 2015

Mr. Craig Mobeck
Assistant Director/City Engineer
City of Sunnyvale, Public Works
P.O. Box 3707
Sunnyvale, CA 94088-3707

Dear Mr. Mobeck:

SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN
Sunnyvale Water Reclamation Program, System No. 4390003

This letter is in regards to the Notice of Preparation of a draft Program Environmental Impact Report (PEIR) for the proposed Sunnyvale Water Pollution Control Plant (WPCP) Master Plan. As part of the Master Plan, the City is proposing to rehabilitate and/or replace several existing secondary and tertiary treatment processes and support facilities. The City, in agreement with the Santa Clara Valley Water District, is also proposing to increase the production and distribution of recycled water in Sunnyvale and other parts of Santa Clara County. The State Water Resources Control Board, Division of Drinking Water (Division) is the responsible agency for the review of all activities related to the production, transmission and use of recycled water. Please provide a copy of the PEIR and WPCP Master Plan to the Division at the following mailing address:

Eric Lacy, P.E.
District Engineer
State Water Resources Control Board
Division of Drinking Water
850 Marina Bay Parkway
Building P, 2nd Floor
Richmond, CA 94804
If you have questions regarding this letter, please contact Ms. Van Tsang at (510) 620-3602.

Sincerely,

Eric Lacy, P.E.
District Engineer
Santa Clara District
Drinking Water Field Operations Branch
Division of Drinking Water

cc: Santa Clara County Environmental Health

Mr. Blair Allen – RWQCB (via email)

Ms. Lorrie Gervin
City of Sunnyvale
P.O. Box 3707
Sunnyvale, CA 94088
APPENDIX B
Air Quality Calculations
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## CONSTRUCTION EMISSIONS - CRITERIA AIR POLLUTANTS

### Master Plan with CAS

<table>
<thead>
<tr>
<th>Stages</th>
<th>Description of Stages</th>
<th>Construction Duration (months)</th>
<th>Comparable phase of Primary/HW project</th>
<th>Cost per Month ($MM/month)</th>
<th>Construction intensity (% cost comparable PT/HW Phase/s)</th>
<th>Approximate Emissions based on Primary Treatment/HW Estimates (lbs/day)</th>
<th>Stage individually Significant?</th>
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<tbody>
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<td>1A</td>
<td>Existing WPCP Rehab (includes floodwall)</td>
<td>24</td>
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<td>1.2 6.9 0.4 0.4</td>
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## WPF with MBR

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<th>Stages</th>
<th>Description of Stages</th>
<th>Construction Duration (months)</th>
<th>Comparable phase of Primary/HW project</th>
<th>Cost per Month ($MM/month)</th>
<th>Construction intensity (% cost comparable PT/HW Phase/s)</th>
<th>Approximate Emissions based on Primary Treatment/HW Estimates (lbs/day)</th>
<th>Stage individually Significant?</th>
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<td>5A</td>
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<td>60</td>
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<td>1.1</td>
<td>48%</td>
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### Primary/Headworks MND Data for Comparison

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<th>Duration of Construction</th>
<th>Cost ($)</th>
<th>Cost/month ($MM/month)</th>
<th>ROG</th>
<th>NOx</th>
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**NOTES:**
NA indicates that not enough information was available to estimate emissions. Conservatively, the impact is therefore considered significant.
### Timeline of Emissions - CAS Option

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**NOTES:**
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### Timeline of Emissions - MBR Option

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**NOTES:**
NA indicates that not enough information was available to estimate emissions. Conservatively, the impact is therefore considered significant.
## OPERATIONAL EMISSIONS - Criteria Air Pollutants

### SUMMARY

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<tr>
<th>Source</th>
<th>ROG (tons/year)</th>
<th>NOx (tons/year)</th>
<th>PM-10 (tons/year)</th>
<th>PM-2.5 (tons/year)</th>
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<td>Total new</td>
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### 1. Cogeneration Facility

#### Emission Factors (lb/MMBtu)

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<th>PM-2.5</th>
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#### Emission Factors (lb/million scf)

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<td>326.4</td>
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<td>Landfill gas</td>
<td>5.2</td>
<td>56</td>
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### Existing

#### Fuel usage (scf/day)

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<td>Natural gas from PG&amp;E</td>
<td>150,000</td>
<td>54,750,000</td>
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<td>Digester Gas</td>
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<td>58,765,000</td>
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<td>105,485,000</td>
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#### 2035 with Master Plan/WPF

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### Net change in emissions

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2. Emergency Standby Generator

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<th>hp</th>
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<table>
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3. Vehicle exhaust emissions

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<th>Miles per one-way trip</th>
<th>Miles/year</th>
<th>Emission factors (tons/year)</th>
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<td>Material delivery trips - T7</td>
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<td>25</td>
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TOTAL OPERATIONAL EMISSIONS

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NET CHANGE IN OPERATIONAL EMISSIONS

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<td># of trips/day</td>
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<td>ROG gms/day</td>
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<td>-------------------</td>
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<td>-------------</td>
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<th># of trips/day</th>
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<th>ROG lb/day</th>
<th>NOX lb/day</th>
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<td>0.08</td>
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APPENDIX C
Greenhouse Gas Emissions Calculations
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## Construction GHG Emission Estimates

### Master Plan with CAS

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<th>Construction Durations (Months)</th>
<th>Comparable phase of Primary/HW Project</th>
<th>Construction Intensity by Cost ($MM/month)</th>
<th>Emissions based on Estimates for Comparable Primary Treatment/HW phase</th>
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<td>2</td>
<td>1.5</td>
<td>169.4</td>
</tr>
<tr>
<td>3A</td>
<td>Filter Control Bldg</td>
<td>15</td>
<td>2 &amp; 3</td>
<td>0.1</td>
<td>10.6</td>
</tr>
<tr>
<td>3B</td>
<td>Congeneration</td>
<td>21</td>
<td>2 &amp; 3</td>
<td>0.6</td>
<td>89.3</td>
</tr>
<tr>
<td>3C</td>
<td>FOG, Digester 5 &amp; Biosolids Postprocessing</td>
<td>24</td>
<td>2</td>
<td>1</td>
<td>129.1</td>
</tr>
<tr>
<td>4A</td>
<td>Split Flow CAS Expansion (Diurnal EQ)</td>
<td>42</td>
<td>-</td>
<td>2.5</td>
<td>NA</td>
</tr>
<tr>
<td>4B</td>
<td>Demo FGRs &amp; AFTS</td>
<td>6</td>
<td>3</td>
<td>0.7</td>
<td>141.9</td>
</tr>
<tr>
<td>4C</td>
<td>Split Flow CAS Clarifiers, Ammonia Feed &amp; Backwash Storage</td>
<td>12</td>
<td>2</td>
<td>1.2</td>
<td>77.4</td>
</tr>
<tr>
<td>5A</td>
<td>Decommission ponds</td>
<td>6</td>
<td>-</td>
<td>0.8</td>
<td>NA</td>
</tr>
<tr>
<td>5B</td>
<td>Future Advanced Facilities (DeNit Filters, Ozone, Microfiltration)</td>
<td>60</td>
<td>2 &amp; 3</td>
<td>1.1</td>
<td>467.9</td>
</tr>
</tbody>
</table>

**TOTAL Master Plan GHG EMISSIONS** | **1910.3**

**EMISSIONS AMORTIZED OVER 30 YEARS** | **63.7**
<table>
<thead>
<tr>
<th>Stage</th>
<th>Description of Stages</th>
<th>Months of Construction</th>
<th>Comparable phase of Primary/HW Project</th>
<th>Construction Intensity by Cost ($MM/month)</th>
<th>Emissions based on Estimates for Comparable Primary Treatment/HW phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>Existing WPCP Rehab (includes Roodwall)</td>
<td>24</td>
<td>-</td>
<td>1.2</td>
<td>NA</td>
</tr>
<tr>
<td>1B</td>
<td>Demo of PSTs &amp; Relocation of Bay Trails</td>
<td>6</td>
<td>3</td>
<td>0.5</td>
<td>101.3</td>
</tr>
<tr>
<td>2A</td>
<td>MBR Milestone 1</td>
<td>3</td>
<td>2 &amp; 3</td>
<td>0.3</td>
<td>6.4</td>
</tr>
<tr>
<td>2B</td>
<td>Admin/Lab Bldg</td>
<td>18</td>
<td>2</td>
<td>0.9</td>
<td>87.1</td>
</tr>
<tr>
<td>2C</td>
<td>Maintenance Bldg &amp; Admin Demo</td>
<td>3</td>
<td>2&amp; 3</td>
<td>0.1</td>
<td>2.1</td>
</tr>
<tr>
<td>2D</td>
<td>Maintenance Bldg</td>
<td>12</td>
<td>2</td>
<td>0.4</td>
<td>25.8</td>
</tr>
<tr>
<td>2E</td>
<td>MBR Milestone 2 (Diuranal EQ &amp; Thickening &amp; Dewatering)</td>
<td>54</td>
<td>-</td>
<td>3.2</td>
<td>NA</td>
</tr>
<tr>
<td>3A</td>
<td>Demo FGRS &amp; AFTs</td>
<td>6</td>
<td>3</td>
<td>0.7</td>
<td>141.9</td>
</tr>
<tr>
<td>3B</td>
<td>RO &amp; UV Facilities</td>
<td>24</td>
<td>2</td>
<td>2.1</td>
<td>271.1</td>
</tr>
<tr>
<td>4A</td>
<td>Cogeneration, FOG &amp; Primary Constrl BLDG Demo</td>
<td>18</td>
<td>2 &amp; 3</td>
<td>0.9</td>
<td>114.8</td>
</tr>
<tr>
<td>4B</td>
<td>Digester 5 &amp; Biosolids Postprocessing</td>
<td>24</td>
<td>2</td>
<td>0.9</td>
<td>116.2</td>
</tr>
<tr>
<td>4C</td>
<td>MBR Expansion</td>
<td>12</td>
<td>2 &amp; 3</td>
<td>0.9</td>
<td>76.6</td>
</tr>
<tr>
<td>5A</td>
<td>Future Advanced Facilities (DeNit Filters, Ozone, Microfiltration</td>
<td>60</td>
<td>2 &amp; 3</td>
<td>1.1</td>
<td>467.9</td>
</tr>
</tbody>
</table>

TOTAL WPF GHG EMISSIONS 1411.2
EMISSIONS AMORTIZED OVER 30 YEARS 47.0
<table>
<thead>
<tr>
<th>Phase</th>
<th>Duration of Construction (months)</th>
<th>Cost ($MM)</th>
<th>Cost/month ($MM/month)</th>
<th>GHG Emissions metric tons of CO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>12</td>
<td>15</td>
<td>1.3</td>
<td>1133.6</td>
</tr>
<tr>
<td>Phase 2</td>
<td>30</td>
<td>78</td>
<td>2.6</td>
<td>419.5</td>
</tr>
<tr>
<td>Phase 3</td>
<td>6</td>
<td>5</td>
<td>0.8</td>
<td>168.9</td>
</tr>
<tr>
<td>Phase 2 &amp; 3</td>
<td>36</td>
<td>83</td>
<td>2.3</td>
<td>588.4</td>
</tr>
<tr>
<td>All Phases</td>
<td>42</td>
<td>98</td>
<td>2.3</td>
<td>1722</td>
</tr>
</tbody>
</table>

NA = Adequate information was not available to estimate emissions.
### GHG OPERATIONAL EMISSIONS - WPCP Improvements

#### Baseline Indirect Emissions from Electricity Consumption

<table>
<thead>
<tr>
<th>GHG</th>
<th>Emission Factor (lb/kWh)</th>
<th>Electricity Consumption kWhr</th>
<th>CO2e* (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2</td>
<td>0.29000</td>
<td>639,480</td>
<td>84.12</td>
</tr>
<tr>
<td>CH4</td>
<td>0.00003</td>
<td>639,480</td>
<td>0.17</td>
</tr>
<tr>
<td>N2O</td>
<td>0.00001</td>
<td>639,480</td>
<td>0.54</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>84.83</td>
</tr>
</tbody>
</table>

#### Indirect Emissions from Electricity Consumption for WPCP

<table>
<thead>
<tr>
<th>GHG</th>
<th>Emission Factor (lb/kWh)</th>
<th>Electricity Consumption kWhr</th>
<th>CO2e* (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2</td>
<td>0.29000</td>
<td>18,816,480</td>
<td>2,475.18</td>
</tr>
<tr>
<td>CH4</td>
<td>0.00003</td>
<td>18,816,480</td>
<td>5.11</td>
</tr>
<tr>
<td>N2O</td>
<td>0.00001</td>
<td>18,816,480</td>
<td>15.95</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>2,496.24</td>
</tr>
</tbody>
</table>

#### Net Increase in Indirect Emissions from Electricity Consumption

<table>
<thead>
<tr>
<th>GHG</th>
<th>Emission Factor (lb/kWh)</th>
<th>Electricity Consumption kWhr</th>
<th>CO2e* (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2</td>
<td>0.29000</td>
<td>18,177,000</td>
<td>2,391.06</td>
</tr>
<tr>
<td>CH4</td>
<td>0.00003</td>
<td>18,177,000</td>
<td>4.93</td>
</tr>
<tr>
<td>N2O</td>
<td>0.00001</td>
<td>18,177,000</td>
<td>15.41</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>2,411.40</td>
</tr>
</tbody>
</table>

Notes: The emission factor for CO2 was obtained from PG&E, 2013. Emission factors for CH4 and N2O are from USEPA, 2014.

*Global Warming Potential for CH4 = 21; GWP for N2O = 310 (CCAR, 2009).


### Project Mobile Sources

#### GHG Emissions Factors for Vehicle Exhaust - For Off-Site Vehicles

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Emission Factors (grams/mile)</th>
<th>Emission Factors (pounds/mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light-Duty Truck (gasoline) (2015)</td>
<td>CO2 347.29, CH4 0.05, N2O 0.09, CH4 0.77</td>
<td>0.00, 0.00, 0.00, 0.00</td>
</tr>
<tr>
<td>Heavy-Duty Truck (diesel) (2015)</td>
<td>CO2 1,771.16, CH4 0.01, N2O 0.00, CH4 3.90</td>
<td>0.00, 0.00, 0.00, 0.00</td>
</tr>
</tbody>
</table>

Notes: CO2 on-road emission factors were derived using EMFAC2014. CH4 and N2O emission factors are from TRC, 2013, Table 13.4.

Heavy Diesel truck = T7 Single Construction
Light duty gasoline truck = LDT1

### Vehicle Exhaust

<table>
<thead>
<tr>
<th>On-road Sources</th>
<th>Miles/trip</th>
<th>Round Trips</th>
<th>Total Emissions (Metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light duty truck (gas)</td>
<td>25</td>
<td>0</td>
<td>CO2 0.00, CH4 0.00, N2O 0.00, CO2* 0.00</td>
</tr>
<tr>
<td>Heavy duty truck</td>
<td>50</td>
<td>1,460</td>
<td>129.29, CO2 0.00, CH4 0.00, N2O 0.00, CO2* 129.41</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>129.29, CO2 0.00, CH4 0.00, N2O 0.00, CO2* 129.41</td>
</tr>
</tbody>
</table>

Notes: Under the Master Plan, it is assumed that there would be no increase in employees working at the WPCP. Truck trips for material deliveries and off-hauling would amount to 4 round trips per day, 7 days a week and 365 days a year.
## GHG OPERATIONAL EMISSIONS - WPF

### Baseline Indirect Emissions from Electricity Consumption

<table>
<thead>
<tr>
<th>GHG</th>
<th>Emission Factor (lb/kWh)</th>
<th>Electricity Consumption kWhr</th>
<th>CO2e* (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2</td>
<td>0.29000</td>
<td>639,480</td>
<td>84.12</td>
</tr>
<tr>
<td>CH4</td>
<td>0.00003</td>
<td>639,480</td>
<td>0.17</td>
</tr>
<tr>
<td>N2O</td>
<td>0.00001</td>
<td>639,480</td>
<td>0.54</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>84.83</strong></td>
</tr>
</tbody>
</table>

### Indirect Emissions from Electricity Consumption for WPF

<table>
<thead>
<tr>
<th>GHG</th>
<th>Emission Factor (lb/kWh)</th>
<th>Electricity Consumption kWhr</th>
<th>CO2e* (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2</td>
<td>0.29000</td>
<td>52,980,480</td>
<td>6,969.22</td>
</tr>
<tr>
<td>CH4</td>
<td>0.00003</td>
<td>52,980,480</td>
<td>14.38</td>
</tr>
<tr>
<td>N2O</td>
<td>0.00001</td>
<td>52,980,480</td>
<td>44.92</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>7,028.52</strong></td>
</tr>
</tbody>
</table>

### Net Increase in Indirect Emissions from Electricity Consumption

<table>
<thead>
<tr>
<th>GHG</th>
<th>Emission Factor (lb/kWh)</th>
<th>Electricity Consumption kWhr</th>
<th>CO2e* (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2</td>
<td>0.29000</td>
<td>52,341,000</td>
<td>6,885.10</td>
</tr>
<tr>
<td>CH4</td>
<td>0.00003</td>
<td>52,341,000</td>
<td>14.20</td>
</tr>
<tr>
<td>N2O</td>
<td>0.00001</td>
<td>52,341,000</td>
<td>44.38</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>6,943.68</strong></td>
</tr>
</tbody>
</table>

**Notes:** The emission factor for CO2 was obtained from PG&E, 2013. Emission factors for CH4 and N2O are from USEPA, 2014. Project baseline and proposed electricity consumption estimates based on data provided by Carollo Engineers.

*Global Warming Potential for CH4 = 21; GWP for N2O = 310 (CCAR, 2009).


### Project Mobile Sources

#### GHG Emissions Factors for Vehicle Exhaust - For Off-Site Vehicles

| Vehicle Type | 
|-------------|--------------------------------------------------|
| Light-Duty Truck (gasoline) | Emission Factors (grams/mile) | Emission Factors (pounds/mile) |
| Light-Duty Truck (gasoline) | CO2 | N2O | CH4 | CO2 | N2O | CH4 |
| 2015 | 347.29 | 0.05 | 0.09 | 0.77 | 0.00 | 0.00 |
| Heavy-Duty Truck (diesel) | 
| Heavy-Duty Truck (diesel) | CO2 | N2O | CH4 | CO2 | N2O | CH4 |
| 2015 | 1,771.16 | 0.01 | 0.00 | 3.90 | 0.00 | 0.00 |

**Notes:** CO2 on-road emission factors were derived using EMFAC2014; CH4 and N2O emission factors are from TRC, 2013, Table 13.4.

Heavy Diesel truck = T7 Single Construction
Light duty gasoline truck = LDT1

### Vehicle Exhaust

<table>
<thead>
<tr>
<th>On-road Sources</th>
<th>Miles/trip</th>
<th>Round Trips</th>
<th>Total Emissions (Metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light duty truck (gas)</td>
<td>25</td>
<td>2,192</td>
<td>16.01</td>
</tr>
<tr>
<td>Heavy duty truck</td>
<td>50</td>
<td>1,460</td>
<td>129.29</td>
</tr>
</tbody>
</table>

| Notes: | With the WPF, there would be 3-4 new employees at the WPCP who are assumed to generate about 6 round trips per day. Truck trips for material deliveries and off-hauling would amount to 4 round trips per day, 7 days a week and 365 days a year. |
APPENDIX D

Biological Resources
### APPENDIX D

**SPECIAL-STATUS PLANTS CONSIDERED FOR POTENTIAL OCCURRENCE IN THE MASTER PLAN AREA BUT REJECTED**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Federal Status</th>
<th>State Status</th>
<th>CRPR</th>
<th>No suitable habitat</th>
<th>Edaphic requirements not present</th>
<th>Outside elevation range</th>
<th>Extirpated from Master Plan vicinity</th>
</tr>
</thead>
<tbody>
<tr>
<td>alkali milk-vetch</td>
<td>Astragalus tener var. tener</td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>arcuate bush-mallow</td>
<td>Malacothamnus arcuatus</td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>bay buckwheat</td>
<td>Eriogonum umbellatum var. bahiiforme</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Ben Lomond buckwheat</td>
<td>Eriogonum nudum var. decurrens</td>
<td>None</td>
<td>None</td>
<td>1B.1</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Brewer's calandrinia</td>
<td>Calandrinia breweri</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Brewer's clarkia</td>
<td>Clarkia breweri</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>bristly leptosiphon</td>
<td>Leptosiphon acicularis</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>brittlescale</td>
<td>Atriplex depressa</td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>California androsace</td>
<td>Androsace elongata ssp. acuta</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>California seablite</td>
<td>Suaeda californica</td>
<td>Endangered</td>
<td>None</td>
<td>1B.1</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>caper-fruitd tropidocarpum</td>
<td>Tropidocarpum capparideum</td>
<td>None</td>
<td>None</td>
<td>1B.1</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>chaparral harebell</td>
<td>Campanula exigua</td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>chaparral ragwort</td>
<td>Senecio aphanactus</td>
<td>None</td>
<td>None</td>
<td>2B.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Choris' popcornflower</td>
<td>Plagiobothrys chorisanus var. chorisanus</td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>clay buckwheat</td>
<td>Eriogonum argillosum</td>
<td>None</td>
<td>None</td>
<td>4.3</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>clustered lady's-slipper</td>
<td>Cypripedium fasciculatum</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>coast iris</td>
<td>Iris longipetala</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Contra Costa goldfields</td>
<td>Lasthenia conjugens</td>
<td>Endangered</td>
<td>None</td>
<td>1B.1</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>cotula navarretia</td>
<td>Navarretia cotulifolia</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Crystal Springs fountain thistle</td>
<td>Cirsium fontinale var. fontinale</td>
<td>Endangered</td>
<td>Endangered</td>
<td>1B.1</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Davidson's bush-mallow</td>
<td>Malacothamnus davidsonii</td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Delta woolly-marbles</td>
<td>Psilocarpus brevissimus var. multilirus</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td></td>
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</table>
## APPENDIX D
### SPECIAL-STATUS PLANTS CONSIDERED FOR POTENTIAL OCCURRENCE IN THE MASTER PLAN AREA BUT REJECTED

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Federal Status</th>
<th>State Status</th>
<th>CRPR</th>
<th>No suitable habitat</th>
<th>Edaphic requirements not present</th>
<th>Outside elevation range</th>
<th>Extirpated from Master Plan vicinity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dudley’s lousewort</td>
<td>Pedicularis dudleyi</td>
<td>None</td>
<td>Rare</td>
<td>1B.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>dusky-fruit ed malacothrix</td>
<td>Malacrothrix phaeocarpa</td>
<td>None</td>
<td>None</td>
<td>4.3</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>fragrant frillitary</td>
<td>Fritillaria lilaccea</td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Franciscan onion</td>
<td>Allium peninsulare var. franciscanum</td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
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<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Gairdner’s yampah</td>
<td>Perideridia gairdneri ssp. gairdneri</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
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<td>x</td>
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<td>x</td>
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<tr>
<td>hairless popcornflower</td>
<td>Plagiobothrys glaber</td>
<td>None</td>
<td>None</td>
<td>1A</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Hall’s bush-mallow</td>
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<td>Hickman’s popcorn-flower</td>
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<td>Eryngium aristatum var. hooveri</td>
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<td>Jepson’s woolly sunflower</td>
<td>Eriophyllum jepsonii</td>
<td>None</td>
<td>None</td>
<td>4.3</td>
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<td>x</td>
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<tr>
<td>Kings Mountain manzanita</td>
<td>Arctostaphylos regismontana</td>
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<td>None</td>
<td>1B.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>large-flowered leptoosiphon</td>
<td>Leptosiphon grandiflorus</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>legenere</td>
<td>Legenere limosa</td>
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<td>None</td>
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<tr>
<td>lesser saltscale</td>
<td>Atriplex minuscula</td>
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<td>None</td>
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<td>x</td>
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<tr>
<td>Lewis’ clarkia</td>
<td>Clarkia lewissii</td>
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<td>Lobb’s aquatic buttercup</td>
<td>Ranunculus lobii</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
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<tr>
<td>Loma Prieta hoita</td>
<td>Hoita strobilina</td>
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<td>None</td>
<td>1B.1</td>
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<tr>
<td>lost thistle</td>
<td>Cirsium praeertiens</td>
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<td>None</td>
<td>1A</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>maple-leaved checkerbloom</td>
<td>Sidalce malachroides</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Marin western flax</td>
<td>Hesperolinon congestum</td>
<td>Threatened</td>
<td>Threatened</td>
<td>1B.1</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Methuselah’s beard lichen</td>
<td>Usnea longissima</td>
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<td>None</td>
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<tr>
<td>Mexican mosquito fern</td>
<td>Azolla microphylla</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
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<td>x</td>
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<tr>
<td>Michael’s rein orchid</td>
<td>Piperia michaelii</td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
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</tr>
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</table>
### APPENDIX D
SPECIAL-STATUS PLANTS CONSIDERED FOR POTENTIAL OCCURRENCE IN THE MASTER PLAN AREA BUT REJECTED

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Federal Status</th>
<th>State Status</th>
<th>CRPR</th>
<th>No suitable habitat</th>
<th>Edaphic requirements not present</th>
<th>Outside elevation range</th>
<th>Extirpated from Master Plan vicinity</th>
</tr>
</thead>
<tbody>
<tr>
<td>minute pocket moss</td>
<td><em>Fissidens pauperculus</em></td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
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<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>most beautiful jewelflower</td>
<td><em>Streptanthus albidus ssp. peramoenus</em></td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Mt. Diablo cottonweed</td>
<td><em>Micropus amphibolus</em></td>
<td>None</td>
<td>None</td>
<td>3.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>narrow-petaled rein orchid</td>
<td><em>Piperia leptopetala</em></td>
<td>None</td>
<td>None</td>
<td>4.3</td>
<td>x</td>
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<td>Oakland star-tulip</td>
<td><em>Calochortus umbellatus</em></td>
<td>None</td>
<td>None</td>
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<td>x</td>
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<tr>
<td>phlox-leaf serpentine bedstraw</td>
<td><em>Galium andrewsiii ssp. gatense</em></td>
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<td>None</td>
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<td>x</td>
<td>x</td>
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<tr>
<td>pincushion navarretia</td>
<td><em>Navarretia myersii ssp. myersii</em></td>
<td>None</td>
<td>None</td>
<td>1B.1</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
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<tr>
<td>Point Reyes salty bird’s-beak</td>
<td><em>Chloropyron maritimum ssp. palustr</em></td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
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<tr>
<td>prostrate vernal pool navarretia</td>
<td><em>Navarretia prostrata</em></td>
<td>None</td>
<td>None</td>
<td>1B.1</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
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<tr>
<td>robust spineflower</td>
<td><em>Chorizanthe robusta var. robusta</em></td>
<td>Endangered</td>
<td>None</td>
<td>1B.1</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>saline clover</td>
<td><em>Trifolium hydrophilum</em></td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>San Antonio Hills monardella</td>
<td><em>Monardella antonina ssp. antonina</em></td>
<td>None</td>
<td>None</td>
<td>3</td>
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<td>x</td>
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<tr>
<td>San Francisco collinsia</td>
<td><em>Collinsia multicolor</em></td>
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<td>1B.2</td>
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<td>San Francisco wallflower</td>
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<td>San Joaquin spear scale</td>
<td><em>Extriplex joquinana</em></td>
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<td>None</td>
<td>1B.2</td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>San Mateo thorn-mint</td>
<td><em>Acanthomintha duttonii</em></td>
<td>Endangered</td>
<td>Endangered</td>
<td>1B.1</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>San Mateo woolly sunflower</td>
<td><em>Eriophyllum latilobum</em></td>
<td>Endangered</td>
<td>Endangered</td>
<td>1B.1</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Santa Clara red ribbons</td>
<td><em>Clarkia concinna ssp. automixa</em></td>
<td>None</td>
<td>None</td>
<td>4.3</td>
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<td></td>
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<tr>
<td>Santa Clara thorn-mint</td>
<td><em>Acanthomintha lanceolata</em></td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
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<td></td>
<td>x</td>
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<tr>
<td>Satan’s goldenbush</td>
<td><em>Isocoma menziesii var. diabolica</em></td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
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<tr>
<td>serpentine leptosiphon</td>
<td><em>Leptosiphon ambiguus</em></td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td></td>
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</tbody>
</table>
### APPENDIX D
SPECIAL-STATUS PLANTS CONSIDERED FOR POTENTIAL OCCURRENCE IN THE MASTER PLAN AREA BUT REJECTED

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Federal Status</th>
<th>State Status</th>
<th>CRPR</th>
<th>No suitable habitat</th>
<th>Edaphic requirements not present</th>
<th>Outside elevation range</th>
<th>Extirpated from Master Plan vicinity</th>
</tr>
</thead>
<tbody>
<tr>
<td>serpentine sunflower</td>
<td><em>Helianthus exilis</em></td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>showy rancheria clover</td>
<td><em>Trifolium amoenum</em></td>
<td>Endangered</td>
<td>None</td>
<td>1B.1</td>
<td>x</td>
<td>x</td>
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<td>x</td>
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<tr>
<td>slender-leaved pondweed</td>
<td><em>Stuckenia filiformis ssp. alpina</em></td>
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<td>None</td>
<td>2B.2</td>
<td>x</td>
<td>x</td>
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<tr>
<td>South Coast Range morning-glory</td>
<td><em>Calystegia collina ssp. venusta</em></td>
<td>None</td>
<td>None</td>
<td>4.3</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>spring lessingia</td>
<td><em>Lessingia tenuis</em></td>
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<td>None</td>
<td>4.3</td>
<td>x</td>
<td>x</td>
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<tr>
<td>stinkbells</td>
<td><em>Fritillaria agrestis</em></td>
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<td>None</td>
<td>4.2</td>
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<td>x</td>
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<td>x</td>
</tr>
<tr>
<td>sylvan microseris</td>
<td><em>Microseris sylvatica</em></td>
<td>None</td>
<td>None</td>
<td>4.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>Tracy’s eriastrum</td>
<td><em>Eriastrum tracyi</em></td>
<td>CR</td>
<td>None</td>
<td>3.2</td>
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<td>x</td>
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<tr>
<td>western leatherwood</td>
<td><em>Dirca occidentalis</em></td>
<td>None</td>
<td>None</td>
<td>1B.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>white-flowered rein orchid</td>
<td><em>Piperia candida</em></td>
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<td>1B.2</td>
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<td>x</td>
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<tr>
<td>woodland woollythreads</td>
<td><em>Monolopia gracilens</em></td>
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<td>None</td>
<td>1B.2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>woolly-headed lessingia</td>
<td><em>Lessingia hololeuca</em></td>
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<td>3</td>
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<td>x</td>
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</tbody>
</table>
APPENDIX E
Secondary Effects of Growth

Summary of Secondary Effects of Growth

Table E-1 summarizes the growth impacts identified in the EIRs for general plans for the WPCP and District service areas. The information presented in Table E-1 is derived from the following environmental documents:


City of Campbell, Environmental Impact Report, Campbell Draft General Plan (July 26, 2001) and Responses to Comments Addendum: Final Environmental Impact Report, Campbell Draft General Plan, SCH#2001042063, September 2001.


City of San José, Envision San José 2040 General Plan Program Environmental Impact Report, June 2011.


1 Due to the geology of the groundwater basin it is not expected that WPF water recharged to the groundwater basin (via the existing recharge ponds and injection wells the District is considering) would be available to wells in the southern part of the District’s service area (southern Santa Clara County); therefore environmental documents of cities in the southern part of the county were not included in the review.


The Cities of Monte Sereno and Saratoga prepared negative declarations for their most recent general plans or general plan element updates and therefore are not represented in Table E-1.
### TABLE E-1
SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH
IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA

<table>
<thead>
<tr>
<th>2010 Census Population</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>140,081</td>
<td>39,349</td>
<td>58,302</td>
<td>29,413</td>
<td>66,790</td>
<td>945,942</td>
<td>116,468</td>
<td>89,960</td>
</tr>
</tbody>
</table>

**AESTHETICS**

**Impacts**
- Impact on scenic vistas due to conversion of rural land to urban uses
- Light and glare impacts
- Temporary and permanent visual impacts from cumulative projects.

**Mitigation Measures**
- Implement General Plan programs and policies that address visual quality in the planning area. (Such policies and measures may include site planning/design procedures and standards, architectural review, and standards pertaining to landscaping and natural areas.)
- Use non reflective windows and glass for all exterior windows and glass.
- Construct and locate exterior lighting such that it would not be mistaken by pilots as airport approach or runway.

**AGRICULTURAL RESOURCES**

**Impacts**
- Conversion of agricultural land to nonagricultural uses
- Cumulative loss of agricultural land
- Conflicts between agricultural uses and adjacent land uses
- Impacts of continued grazing and farming on soil or other environmental resources

**Mitigation Measures**
- Prepare a cumulative impact analysis of projected losses due to the permanent conversion of south county agricultural lands.
- Evaluate and adopt mechanisms (e.g., impact fees, conservation easements, and purchase of development rights) to offset impacts on prime agricultural lands.

S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
## TABLE E-1 (Continued)

### SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH

**IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>AGRICULTURAL RESOURCES (cont.)</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation Measures (cont.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Implement recommendations of a study on the development of golf courses in areas zoned for agriculture to reduce impacts.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Implement General Plan programs and policies, and measures identified in the General Plan EIR, to protect agricultural and prevent its conversion to non-agricultural uses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>AIR QUALITY</td>
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</tr>
<tr>
<td>Impacts</td>
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</tr>
<tr>
<td>• Conflicts with, or obstruction of, the implementation of an applicable air quality attainment plan or congestion management plan</td>
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<tr>
<td>• Violation of a stationary source air quality standard or contribution to an existing or projected air quality violation</td>
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<tr>
<td>• Violate an air quality standard or contribute to an existing or projected air quality violation during construction</td>
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<tr>
<td>• Increases in air emissions and/or ozone precursors</td>
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<tr>
<td>• Exposure of new sensitive land uses to toxic air contaminant</td>
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<tr>
<td>• Exposure of new sensitive land uses to local odor emission sources</td>
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<td>• Exposure of sensitive receptors to substantial pollutant concentrations</td>
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<tr>
<td>• Construction-related air quality impacts</td>
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<tr>
<td>• Cumulative impacts on regional air quality</td>
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<tr>
<td>• Provide site features and implement measures to encourage use of alternative modes of travel and reduce vehicle trips. (Such measures include implementing improvements to bicycle and pedestrian circulation systems and working with local and regional planning and transportation agencies to improve public transit services.)</td>
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<tr>
<td>• Require future projects, as appropriate, to include site features that facilitate walking.</td>
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<tr>
<td>• Implement General Plan measures that reduce dependence on automobile use and improve the efficiency of the existing transportation system.</td>
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</table>

S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
### TABLE E-1 (Continued)
**SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>AIR QUALITY (cont.)</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>City of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
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<tbody>
<tr>
<td><strong>Mitigation Measures</strong></td>
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<tr>
<td>• Implement BAAQMD basic and additional construction measures and other specified measures.</td>
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<tr>
<td>• Implement off road equipment control measures, measures to reduce architectural coating ROC emissions, and best management practices to control particulate emissions.</td>
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<tr>
<td>• Ensure proposed backup diesel generator meets U.S EPA low emissions standards.</td>
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<tr>
<td>• Implement identified dust control measures at all construction sites and implement additional identified measures (e.g., to stabilize disturbed areas) at larger sites.</td>
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<tr>
<td>• Require adequate buffers, ventilation systems, and other measures to reduce impacts of odors or toxic emissions.</td>
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<tr>
<td>• Implement General Plan natural resource chapter policies regarding air quality impacts.</td>
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<tr>
<td>• Facilitate mixed-use development and maintain jobs/housing balance.</td>
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<tr>
<td>• Implement General Plan transportation control measures to reduce vehicle miles traveled and associated air pollutant emissions.</td>
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<tr>
<td>• Implement a Community Risk Reduction Plan to address Toxic Air Contaminants consistent with the BAAQMD.</td>
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<tr>
<td>• Screen development to ensure sensitive uses are not located near sources of air pollution.</td>
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<table>
<thead>
<tr>
<th>BIOLOGICAL RESOURCES</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>City of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
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<tbody>
<tr>
<td><strong>Impacts</strong></td>
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<tr>
<td>• Impacts on/loss of special-status animal or plant species</td>
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<tr>
<td>• Loss of ornamental street trees</td>
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<tr>
<td>• Impacts on biological resources due to individual or cumulative impacts on wetlands, riparian habitat, or other sensitive habitat</td>
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<tr>
<td>• Disruption of wildlife migration or travel corridors or impedance of use of native wildlife nursery sites</td>
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<tr>
<td>• Conflict with policies protecting biological resources.</td>
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</tbody>
</table>

S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
### TABLE E-1 (Continued)

**SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH**

**IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>Biological Resources (cont.)</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
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<tbody>
<tr>
<td><strong>Impacts (cont.)</strong></td>
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<tr>
<td>- Adverse impacts on roosting and breeding bats.</td>
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<tr>
<td>- Emission of nitrogen compounds that could affect the species composition and viability of serpentine grasslands as a consequence of development under the General Plan and cumulative development</td>
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<tr>
<td>- Incremental encroachment on biological resources from cumulative projects.</td>
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<tr>
<td><strong>Mitigation Measures</strong></td>
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<tr>
<td>- Implement General Plan policies and programs to protect biological resources.</td>
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<tr>
<td>- Implement measures from City guidelines for land use near streams.</td>
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<tr>
<td>- Mitigate the removal of protected trees by planning new trees at the specified ratio.</td>
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<tr>
<td>- Conduct project-specific environmental review and implement mitigation.</td>
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<tr>
<td>- Require project-specific surveys conducted by qualified professionals according to established protocols to determine on-site resources and appropriate site-specific mitigation measures.</td>
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<tr>
<td>- Implement bird-safe building design that does not conflict with energy efficiency goals and work with future tenants to implement a lights-out program.</td>
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<tr>
<td>- Avoid construction during nesting season, or if unavoidable, conduct surveys by qualified professional and implement measures to avoid disturbance of active nests.</td>
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<tr>
<td>- Conduct pre-construction survey for burrowing owls and if the presence of owls is verified implement identified measure to avoid or reduce impacts.</td>
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<tr>
<td>- No artificial owl habitat shall be established near or adjacent to salt marsh harvest mouse and salt marsh wandering shrew habitat.</td>
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<tr>
<td>- Conduct pre-construction survey for bats in trees and vacant buildings in advance of tree removal or demolition and implement specified measure to avoid or reduce impacts on maternal bat colonies or hibernating bats.</td>
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<tr>
<td>- Develop a program to educate the public and landowners about sensitive biotic resources in the area and best management practices for preserving those resources.</td>
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<td>X</td>
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</table>

*S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report*
TABLE E-1 (Continued)
SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH
IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA

<table>
<thead>
<tr>
<th>BIOLOGICAL RESOURCES (cont.)</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
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<tbody>
<tr>
<td><strong>Mitigation Measures (cont.)</strong></td>
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<tr>
<td>• Implement General Plan transportation control measures to reduce vehicle miles traveled and associated nitrous oxide emissions.</td>
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<tr>
<td>• Participate in the Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan.</td>
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<tr>
<td>• If the Habitat Plan is not adopted, develop and implement a program for the preservation of serpentine grasslands, as City resources allow.</td>
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<table>
<thead>
<tr>
<th>CULTURAL RESOURCES</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
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<td><strong>Impacts</strong></td>
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<tr>
<td>• Disturbance of historical resource(s)</td>
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<tr>
<td>• Disturbance of archaeological resource(s)</td>
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<tr>
<td>• Disturbance of paleontological resource(s)</td>
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<tr>
<td>• Disturbance of human remains</td>
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<tr>
<td>• Cumulative impacts on historical resources</td>
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<td><strong>Mitigation Measures</strong></td>
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<tr>
<td>• Conduct project-specific review and implement identified mitigation consistent with General Plan cultural resource policies.</td>
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<tr>
<td>• Conduct the proposed work consistent with the state and federal standards for historic resources.</td>
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<tr>
<td>• Implement CEQA Guidelines Section 15064.5 provisions for the accidentally discovery of historic or archaeological resources.</td>
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<tr>
<td>• Support the preservation of historic buildings and structures.</td>
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<tr>
<td>• Implement measures to protect historic, archaeological, and paleontological resources.</td>
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<tr>
<td>• Retain a qualified archaeologist and qualified paleontologist to establish procedures to follow in the event significant archaeological or paleontological resources are uncovered and to monitor site clearing and grading operations.</td>
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</table>

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TABLE E-1 (Continued)
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<tr>
<td>• If human remains are discovered, cease construction activities and contact the County coroner; notify Native American Heritage Commission (NAHC) and implement related procedures as specified.</td>
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<tr>
<td>• Implement archaeological monitoring program.</td>
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<tr>
<td>GEOLOGY AND SOILS</td>
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<tr>
<td>Impacts</td>
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<td>City of Cupertino</td>
<td>City of Los Gatos</td>
<td>City of Milpitas</td>
<td>City of San Jose</td>
<td>City of Santa Clara</td>
<td>Santa Clara County</td>
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<tr>
<td>Exposure to hazards from strong seismic ground shaking</td>
<td>S</td>
<td>U</td>
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<tr>
<td>Exposure of the public to hazards associated with unreinforced masonry structures</td>
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<tr>
<td>Impacts from lateral spreading, subsidence, liquefaction, seismically induced settlement, collapse of a geologic unit, and/or location of project on expansive soils</td>
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<tr>
<td>Exposure of more people and property to geologic and seismic risks due to cumulative projects.</td>
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<tr>
<td>Mitigation Measures</td>
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<tr>
<td>• Implement General Plan policies and programs to mitigate potential geologic and seismic hazards.</td>
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<tr>
<td>• Adopt and enforce the most recent state seismic requirements and applicable standards for structural design of new development and redevelopment (e.g., the Uniform Building Code and California Building Code).</td>
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<td></td>
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<td>X</td>
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</tr>
<tr>
<td>• Require conformance with the City’s Building and Construction Code.</td>
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<td>X</td>
</tr>
<tr>
<td>• Support office buildings and parking structures on deep foundations; implement recommendations of site geotechnical report, and monitor grading and earthwork during construction for conformance with geotechnical recommendations.</td>
<td></td>
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<td>X</td>
</tr>
<tr>
<td>• Compact all fill and scarified surface soils as specified.</td>
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<td>X</td>
</tr>
<tr>
<td>• Conduct geotechnical investigation to identify areas that require excavation and recompackaging, identify these areas on grading plans, and execute the required actions.</td>
<td></td>
<td></td>
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<td></td>
<td>X</td>
</tr>
</tbody>
</table>

S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
### Table E-1 (Continued)

**SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>GEOLOGY AND SOILS</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation Measures (cont.)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Remove existing utilities or abandon in place consistent with approval of geotechnical engineer.</td>
<td>X</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Implement corrosion protection measures consistent with recommendations of geotechnical report.</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>• Construct projects in accordance with Uniform Building Code standards and project-specific mitigation.</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>• Prepare and submit for review and approval a geotechnical report that investigates the subject foundation excavations and ensure that compressibility does not underlie the footing.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Implement County plans and policies to reduce impacts; however substantial property damage and loss of life could occur in a major earthquake.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### GREENHOUSE GAS EMISSIONS & CLIMATE CHANGE

<table>
<thead>
<tr>
<th>Impacts</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Projected 2035 GHG emissions will exceed the average carbon-efficiency standard necessary to meet statewide 2050 goals established by Executive Order S-3-05.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>U</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td>• Contribute to cumulative impacts of global climate change due to exceeding the average carbon-efficiency standard necessary to meet statewide 2020 goals established by AB 32.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>U</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>• Exposure to significant adverse physical impacts from the effects of global climate change</td>
<td></td>
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<td></td>
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<td>U</td>
<td></td>
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<tr>
<td>• Increased GHG emissions</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mitigation Measures</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Implement the Greenhouse Gas Reduction Strategy included in the General Plan.</td>
<td></td>
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<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>• Participate in the development of a Sustainable Community Strategy in compliance with SB 375 – Redesigning Communities to Reduce Greenhouse Gases.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>• Prepare and implement a comprehensive Climate Action Plan to achieve a fair share of statewide GHG emission reductions consistent with AB 32.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
### GREENHOUSE GAS EMISSIONS & CLIMATE CHANGE

**Mitigation Measures (cont.)**

- Prepare and implement a climate change preparedness analysis to address adaptation to climate change.
  - City of Sunnyvale
  - City of Campbell
  - City of Cupertino
  - Town of Los Gatos
  - City of Milpitas
  - City of San Jose
  - City of Santa Clara
  - Santa Clara County

- Implement General Plan policies to reduce GHG emissions.
  - X

- Implement BAAQMD measures to reduce construction-related GHG emissions.
  - X

### HAZARDS AND HAZARDOUS MATERIALS

**Impacts**

- Release of or exposure to hazardous materials
  - S

- Exposure to soil and/or groundwater contamination
  - S

- Location on site included on list of hazardous materials sites
  - S

- Exposure to asbestos and/or lead based paint
  - S

- Impacts on emergency response capacity
  - S

- Increased exposure to fire hazard in urban and rural areas

- Cumulative impact with respect to hazards and hazardous materials
  - S

**Mitigation Measures**

- Conduct project-specific environmental review and implement identified measures to mitigate identified potential hazards.
  - X

- Prior to development of or near a reported hazardous material site, implement specified measures, including appropriate site assessment, remediation, and follow-up investigation.
  - X

- Require submittal of plan detailing procedures to be implemented if storage tanks or hazardous materials or wastes are discovered during grading or construction.
  - X

- Retain certified asbestos consultant to perform survey; if asbestos-containing material is present, demolition activities shall be undertaken by certified contractor in compliance with state law.
  - X

---

S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
### TABLE E-1 (Continued)

**SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>HAZARDS AND HAZARDOUS MATERIALS (cont.)</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation Measures (cont.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Prior to renovation or demolition determine whether paint must be separated from building materials, due to lead content, to ensure appropriate handling and disposal.</td>
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<td>X</td>
</tr>
<tr>
<td>• Prepare and submit to the Community Development Department an emergency preparedness plan; encourage disaster service training for businesses and employees in the specific plan area; pursue establishment of an American Red Cross facility in the specific plan area; and incorporate requirements related to homeland security.</td>
<td></td>
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<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Require proper storage and disposal of hazardous materials, including implementation of a Household Hazardous Waste Program.</td>
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<td>X</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>HYDROLOGY AND WATER QUALITY</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Impacts</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Degradation of surface water quality from construction activities and/or post-construction uses</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Exposure of people and property to flooding</td>
<td>S</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>• Impacts on stormwater drainage infrastructure or alteration of drainage patterns</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Reduction of groundwater recharge due to increases in impervious surface area</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>• Alteration of drainage patterns and flow rates from cumulative projects</td>
<td>S</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>• Effects of pollutants in stormwater runoff from cumulative projects</td>
<td>S</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Require projects to incorporate applicable best management practices of the National Pollutant Discharge Elimination System permit and requirements of other applicable plans to control runoff pollutants and sedimentation.</td>
</tr>
<tr>
<td>• Utilize FEMA maps to prevent inappropriate development in flood prone areas; new development within flood zones shall obtain a Flood Elevation Certificate and meet all municipal code requirements.</td>
</tr>
</tbody>
</table>

*S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report*
### TABLE E-1 (Continued)

**SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>Hydrology and Water Quality</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation Measures (cont.)</td>
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<td></td>
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</tr>
<tr>
<td>• Limit on-site grading to the extent feasible.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Require property owner/developer to maintain drainage facilities and label new storm drain inlets.</td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td>• During application review consider all opportunities to enhance groundwater recharge.</td>
<td>X</td>
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</tbody>
</table>

### Land Use & Planning

<table>
<thead>
<tr>
<th>Impacts</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Land use incompatibilities</td>
<td>S</td>
<td></td>
<td>S</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Intensification of land uses or substantial changes in land use density, scale, and/or character</td>
<td>U</td>
<td></td>
<td>U</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Loss of open space or agricultural lands or the premature urbanization of rural areas</td>
<td></td>
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<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>• Cumulative impacts on agricultural resources</td>
<td>U</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>• Inefficient land use patterns</td>
<td></td>
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<td>S</td>
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</tr>
</tbody>
</table>

**Mitigation Measures**

- Implement applicable General Plan land use programs and policies that address the clustering of development, resource protection, zoning code modification(s), potential impacts of intensified land uses, conflicts between incompatible land uses, impacts on open space, and/or golf course development.
- Dedicate avigation easement; notify Federal Aviation Administration.
- Conduct project-specific environmental review and applicable design and architectural review, and implement mitigation consistent with General Plan land use policies.
- Establish 20-year growth limits consistent with the urban growth boundary policy.
- Deny expansion of commercial development into viable agricultural land and emphasize in-fill to meet these needs (to be implemented by the LAFCO).
- Implement the appropriate recommendations of the agricultural preserve study

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U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
## TABLE E-1 (Continued)
SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA

<table>
<thead>
<tr>
<th>LAND USE &amp; PLANNING</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation Measures (cont.)</td>
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<tr>
<td>• Conduct studies and implement recommendations on recreational vehicle park needs and golf course development.</td>
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</tr>
<tr>
<td>• Implement General Plan policies that encourage protection of agricultural lands through Williamson Act contracts, agricultural conservation easements and transfers of development rights.</td>
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</tr>
<tr>
<td>NOISE</td>
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</tr>
<tr>
<td>Impacts</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Exposure to or generation of excessive noise levels or ground borne vibration</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>• Short-term noise impacts during construction</td>
<td>S / U</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>U</td>
<td>S</td>
</tr>
<tr>
<td>• Increased noise from traffic and/or cumulative noise impacts from increased traffic</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>U</td>
<td>U</td>
<td>U</td>
</tr>
<tr>
<td>• Substantial permanent increase in ambient noise levels in project vicinity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>U</td>
<td></td>
<td>U</td>
</tr>
<tr>
<td>Mitigation Measures</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>• Implement General Plan programs and policies that reduce noise impacts.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Implement/require measures to reduce construction noise (e.g., requiring limits on construction hours, use of hospital-grade mufflers on equipment, use of sound barriers or baffles, and/or limits on the number of active building permits issued).</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Conduct project-level environmental review and implement identified mitigation.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td>• Enforce applicable noise insulation standards of the state building code (Title 24) and adopt and enforce local noise ordinances.</td>
<td>X</td>
<td></td>
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<td></td>
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<td>X</td>
<td>X</td>
</tr>
<tr>
<td>• Include appropriate/feasible noise attenuation techniques in the design new streets and/or implement improvements to reduce noise impacts from existing streets.</td>
<td>X</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>• Evaluate proposed new developments near railroad rights of way for potential vibration impacts and require developers to incorporate measures to minimize vibration impacts to the maximum feasible extent.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

S = Significant mitigable impact    U = Significant and unavoidable impact    X = Mitigation measure identified in Environmental Impact Report
### TABLE E-1 (Continued)

**SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>POPULATION AND HOUSING</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>City of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impacts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Indirect inducement of population and housing growth throughout the region</td>
<td>U</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Jobs/housing imbalances, oversupply of jobs</td>
<td>U</td>
<td></td>
<td></td>
<td></td>
<td>U</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Increased jobs-housing imbalance from cumulative development</td>
<td>U</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mitigation Measures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Implement General Plan land use programs and policies that address jobs/housing imbalances.</td>
<td></td>
<td></td>
<td></td>
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<td>X</td>
<td></td>
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</tr>
<tr>
<td>• Contribute to the City Housing Mitigation Fund, which the City shall use to address jobs/housing imbalances.</td>
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<tr>
<td>• Implement General Plan air quality policies and programs to reduce vehicle miles traveled and associated air pollutant emissions.</td>
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<td><strong>PUBLIC SERVICES</strong></td>
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<td><strong>Impacts</strong></td>
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<tr>
<td>• Increased demand for police protection services</td>
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<tr>
<td>• Increased demand for emergency and public services</td>
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<tr>
<td>• Increased demand for schools, including cumulative demand</td>
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<td>S, U</td>
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<tr>
<td>• Increased demands on public services from cumulative projects</td>
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<td><strong>Mitigation Measures</strong></td>
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<tr>
<td>• Implement specified General Plan programs and policies and mitigation identified in the General Plan EIR that address funding for and the provision and maintenance of community services and/or facilities.</td>
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<tr>
<td>• The project applicant shall enter into a binding agreement with City regarding addition of adequate public safety facilities and equipment.</td>
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<tr>
<td>• Incorporate a comprehensive on-site security system to help reduce potential calls for police protection service.</td>
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</table>

S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
### TABLE E-1 (Continued)

**SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>PUBLIC SERVICES</th>
<th>City of Sunnyvale(^a)</th>
<th>City of Campbell(^b)</th>
<th>City of Cupertino(^c)</th>
<th>Town of Los Gatos(^d)</th>
<th>City of Milpitas(^e)</th>
<th>City of San Jose(^f)</th>
<th>City of Santa Clara(^g)</th>
<th>Santa Clara County(^h)</th>
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</thead>
<tbody>
<tr>
<td><strong>Mitigation Measures (cont.)</strong></td>
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<tr>
<td>• Prior to approval of grading plan, require submittal of an emergency fire access plan for review and approval.</td>
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<tr>
<td>• Prior to issuance of a building permit, require submittal of a plan showing that all buildings except parking structures will have sprinkler systems in accordance with Municipal Code and submittal of a Construction Fire Protection Plan.</td>
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<tr>
<td>• Prior to approval of a street improvements plan, ensure the water supply system is designed to provide sufficient fire flow pressure and storage for the proposed land use.</td>
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<tr>
<td>• The City shall monitor its needs and allocate the appropriate funds for additional facilities, staff, and equipment.</td>
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<tr>
<td>• Cooperate with school districts regarding enrollment projections, the collection of school impact fees, and/or implement other specified measures to provide for and maintain adequate educational services.</td>
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</table>

| RECREATION | | | | | | | | |
| **Impacts** | | | | | | | | |
| • Cumulative impacts on overused park facilities | | | | | | U | | |

| **Mitigation Measures** | | | | | | | | |
| • Encourage the use of less-utilized parks in the County. | | | | | | | X | |

| TRAFFIC AND TRANSPORTATION | | | | | | | | |
| **Impacts** | | | | | | | | |
| • Conflict with plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system. | S | U | | | | | | |
| • Conflict with applicable congestion management program including level of service standards and travel demand measures | | | | | | | U | |
| • Change in air traffic patterns | S | | | | | | | |
| • Increased traffic relative to existing traffic and the capacity of the street system | S | | | | | | | |

S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
### TABLE E-1 (Continued)

**SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH**

**IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>TRAFFIC AND TRANSPORTATION (cont.)</th>
<th>City of Sunnyvale&lt;sup&gt;a&lt;/sup&gt;</th>
<th>City of Campbell&lt;sup&gt;b&lt;/sup&gt;</th>
<th>City of Cupertino&lt;sup&gt;c&lt;/sup&gt;</th>
<th>City of Los Gatos&lt;sup&gt;d&lt;/sup&gt;</th>
<th>City of Milpitas&lt;sup&gt;e&lt;/sup&gt;</th>
<th>City of San Jose&lt;sup&gt;f&lt;/sup&gt;</th>
<th>City of Santa Clara&lt;sup&gt;g&lt;/sup&gt;</th>
<th>Santa Clara County&lt;sup&gt;h&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impacts (cont.)</strong></td>
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<tr>
<td>• Construction-related traffic impacts</td>
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<tr>
<td>• Degradation of levels of service on area roads, highways, or freeways</td>
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<td>U</td>
<td>U</td>
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<tr>
<td>• Increased vehicle delays at area intersections</td>
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<td>U</td>
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<tr>
<td>• Conflict with policies and standards regarding site access by automobiles, pedestrians, and bicyclists</td>
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<tr>
<td>• Cumulative traffic impacts on roadway segments and/or intersections</td>
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<tr>
<td>• Cumulative conflict with a plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system</td>
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<tr>
<td>• Increase in traffic and congestion on roadway segments in other jurisdictions</td>
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<tr>
<td>• Increased emergency response times due to increased traffic and congestion</td>
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<tr>
<td><strong>Mitigation Measures</strong></td>
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<tr>
<td>• Implement General Plan and/or local transportation plan programs and policies and measures identified in the General Plan to mitigate traffic and circulation impacts.</td>
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<tr>
<td>• Prepare and implement a traffic control plan for construction.</td>
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<tr>
<td>• Prepare and implement a traffic mitigation fee program to guarantee funding for roadway and infrastructure improvements needed to mitigate impacts from future projects.</td>
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<tr>
<td>• Work with transit agencies to improve local transit service, develop new transportation facilities, and encourage public transit ridership.</td>
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<tr>
<td>• Implement measures to encourage the use of alternative modes of travel and reduce vehicle trips.</td>
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<tr>
<td>• Implement design changes to improve vehicle, pedestrian, and bicycle access.</td>
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<tr>
<td>• Provide fair share contribution for required improvements at specified intersections and ramp intersections; freeway improvements identified in specified applicable plans Valley Transportation Plan; or the Central Expressway Project, as specified.</td>
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</table>

S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
### TABLE E-1 (Continued)

**SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA**

<table>
<thead>
<tr>
<th>TRAFFIC AND TRANSPORTATION (cont.)</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
<th>City of Santa Clara</th>
<th>Santa Clara County</th>
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</thead>
<tbody>
<tr>
<td><strong>Mitigation Measures (cont.)</strong></td>
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<tr>
<td>• Pay all applicable transportation fees as contribution to improvements; create Citywide Deficiency Plan for offsetting impacts where capacity improvements are infeasible.</td>
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<tr>
<td>• Prior to the second phase of plan development, construct specified traffic signal to the satisfaction of the Public Works Director.</td>
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<tr>
<td>• Submit Circulation Plan and identified traffic mitigation measures to the Department of Public Safety for review and prepare an Emergency Access Plan if required.</td>
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<tr>
<td>• Prepare and implement a construction traffic control plan.</td>
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<tr>
<td>• Limit construction time periods to off-peak hours.</td>
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<tr>
<td>• Coordinate traffic signals, improve intersection capacity, and implement other operational measures to maximize the efficiency of the circulation system.</td>
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<tr>
<td>• Add various combinations of turn lanes, through lanes, off- and on-ramps, and/or widen lanes at intersections where unacceptable levels of service occur.</td>
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<tr>
<td>• Expand highway capacity to relieve some bottlenecks.</td>
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<tr>
<td>• Implement parking provisions described in the General Plan.</td>
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<tr>
<td>• Redistribute emergency service station boundaries and implement traffic signal pre-emption for emergency vehicles.</td>
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<tr>
<td>• Create a dedicated funding source for implementation of General Plan roadway and intersection improvements.</td>
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<tr>
<td><strong>UTILITIES</strong></td>
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<td><strong>Impacts</strong></td>
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<tr>
<td>• Insufficient water system infrastructure capacity</td>
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<tr>
<td>• Increased demand for wastewater treatment capacity</td>
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<tr>
<td>• Insufficient wastewater system infrastructure capacity</td>
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<tr>
<td>• Impacts on landfill capacity</td>
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</tbody>
</table>

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TABLE E-1 (Continued)
SIGNIFICANT MITIGABLE AND SIGNIFICANT UNAVOIDABLE IMPACTS OF GROWTH
IDENTIFIED IN GENERAL AND SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORTS IN PROJECT AREA

<table>
<thead>
<tr>
<th>Utilities (cont.)</th>
<th>City of Sunnyvale</th>
<th>City of Campbell</th>
<th>City of Cupertino</th>
<th>Town of Los Gatos</th>
<th>City of Milpitas</th>
<th>City of San Jose</th>
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<tbody>
<tr>
<td><strong>Impacts (cont.)</strong></td>
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<tr>
<td>• Increased demand for solid waste services</td>
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<tr>
<td>• Potential for future cumulative groundwater basin demand to exceed the aquifer’s safe yield</td>
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<td>PS</td>
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<tr>
<td>• Increased demand for electricity and gas services and potential need to relocate or underground existing and future utility lines</td>
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<tr>
<td><strong>Mitigation Measures</strong></td>
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<tr>
<td>• Encourage the implementation of water conservation measures.</td>
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<tr>
<td>• Implement General Plan policies to find an alternative disposal site to meet the city’s future disposal needs.</td>
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<tr>
<td>• Implement specified General Plan policies and programs that address the adequacy of and improvements to the existing utility infrastructure and the potential for using recycled water.</td>
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<tr>
<td>• Upgrade key parts of the storm drainage system.</td>
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<tr>
<td>• Adopt a capital improvement plan for water distribution system improvements; review development plans to identify water system needs; require project applicants to pay fair share fees to fund identified improvements, or to make the improvements.</td>
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<tr>
<td>• Work with sanitary districts to ensure adequate capacity for future land uses.</td>
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<tr>
<td>• Adopt a capital improvement plan for wastewater system improvements; review development plans to identify wastewater system needs; require project applicants to pay fair share fees to fund the improvements, or to make the improvements.</td>
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<tr>
<td>• Implement General Plan policies to encourage water conservation and reduce demand from current and future development</td>
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<tr>
<td>• Implement General Plan policies to increase use of recycled water</td>
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<tr>
<td>• Continue to implement current recycling ordinances and zero-waste policies to increase the diversion rate and lower the per capita disposal rate.</td>
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</table>

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### TABLE E-1 (Continued)

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</thead>
<tbody>
<tr>
<td><strong>Mitigation Measures (cont.)</strong></td>
<td>Submit a solid waste/recycling management plan to the City for review and approval.</td>
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<tr>
<td></td>
<td>Groundwater pumping supply quantities will be updated in the Urban Water Management Plan every five years to align water availability with demand.</td>
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<td>Review project plans for compliance with California Title 24 energy conservation requirements. Require projects to submit an energy conservation plan for review and approval.</td>
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S = Significant mitigable impact  
U = Significant and unavoidable impact  
X = Mitigation measure identified in Environmental Impact Report
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