3.15 UTILITIES

Introduction

The SUMC Project would result in increased on-site employment, visitorship, and developed floor space. These increases have the potential to create greater demand for utilities, including water supply, wastewater collection and treatment, storm drainage, solid waste disposal, and energy (which includes electricity and natural gas). This section assesses whether the potential increase in demand would overtax, to a significant degree, the capacity of the infrastructure systems serving the SUMC Sites. Information regarding the existing and projected demand within the SUMC Sites has been collected from the City of Palo Alto Utilities Department (CPAU), the sponsors for the SUMC Project, and other applicable sources.

Issues identified in response letters to the NOP, and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project, were considered in preparing this analysis. The majority of comments provided in response letters and meetings pertain to impacts on water supply. Water supply comments include the need to conduct a water supply assessment, potential impacts on the Hetch Hetchy water system, recommendations for water conservation techniques, and the need to evaluate the potential use of recycled water. Other comments pertain to the SUMC Project’s recycling and disposal programs and compliance with the City’s Zero Waste Strategic Plan. Such comments were received from the Palo Alto Planning and Transportation Commission, City Council, City of Palo Alto Public Works, the Crescent Park Neighborhood Association, and private individuals and organizations. These comments were considered in the preparation of this analysis. It should be noted that one NOP comment inquired about placement of a new Hetch Hetchy pipeline to serve the Santa Clara Valley Water District (SCVWD). Such an action is beyond the scope of the SUMC Project being evaluated in this EIR and would be under the jurisdiction of the San Francisco Public Utilities Commission (SFPUC) rather than the City of Palo Alto.

As discussed in Section 2, Project Description, during the construction of the SUMC Project, some utility lines would be capped, rerouted, or replaced and new utility lines would be needed to serve the increased demand from the SUMC Project. The improvements to the utility distribution system would require trenching and construction activity, which could have impacts relating to noise, air quality, traffic circulation, cultural resources, biological resources, and hydrology. Impacts relating to construction activity, including construction of the utility infrastructure, are assumed in the construction analysis presented in each of the technical sections of this EIR, where appropriate. Besides those construction activities described in the SUMC Project Description, no additional off-site construction relating to utilities would occur. This section analyzes the utility demand of the SUMC Project to determine if additional infrastructure is required, the construction of which could result in additional environmental impacts.
Existing Conditions

Water Supply

City of Palo Alto Water Demands and Demand Management Measures. Water use in the City is dominated by residential uses, but also includes significant use by commercial, industrial, City facility, and public facility customer classes, as shown in Table 3.15-1. The table also shows the City’s projections of future water use in millions of gallons per day (mgd), prior to additional demand management measures and without implementation of the SUMC Project.

<table>
<thead>
<tr>
<th>Use by Account Type (mgd)</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Family Residential</td>
<td>5.86</td>
<td>5.91</td>
<td>5.95</td>
<td>6.00</td>
<td>6.00</td>
<td>6.02</td>
</tr>
<tr>
<td>Multiple-Family Residential</td>
<td>1.99</td>
<td>2.00</td>
<td>1.99</td>
<td>1.99</td>
<td>1.98</td>
<td>1.97</td>
</tr>
<tr>
<td>Commercial</td>
<td>2.37</td>
<td>2.34</td>
<td>2.33</td>
<td>2.31</td>
<td>2.31</td>
<td>2.31</td>
</tr>
<tr>
<td>Industrial</td>
<td>1.24</td>
<td>1.26</td>
<td>1.28</td>
<td>1.29</td>
<td>1.30</td>
<td>1.32</td>
</tr>
<tr>
<td>City Facilities</td>
<td>0.56</td>
<td>0.58</td>
<td>0.59</td>
<td>0.61</td>
<td>0.62</td>
<td>0.62</td>
</tr>
<tr>
<td>Public Facilities</td>
<td>0.35</td>
<td>0.36</td>
<td>0.37</td>
<td>0.38</td>
<td>0.38</td>
<td>0.39</td>
</tr>
<tr>
<td>Unaccounted For Waterb</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
</tr>
</tbody>
</table>


Notes:

a. 2005 projections represent an average use and are not representative of 2005 actual use.

b. Based on City of Palo Alto Utilities 2005 Urban Water Management Plan. This does not reflect actual losses.

c. Total does not reflect additional demand management measures, which are water conservation programs that the City intends to implement in order to reduce the potable water demands within Palo Alto.

The City’s projections of water use are based on the SFPUC’s 2004 Wholesale Customer Water Demand Projections Study (Demand Study), which analyzed water demands associated with each customer sector and then forecasted demands over a 25-year planning horizon. The Demand Study evaluated demands in each of the SFPUC’s wholesale customers’ service areas using data provided by the wholesale customers; this provided a uniform way for demands within SFPUC to be analyzed. The projections were developed using an “End Use” model, which initially establishes a base-year water demand at the end-use level (such as toilets and showers) and calibrates the model to initial conditions, and then forecasts future water demand based on projected demands of existing water service accounts and future growth in the number of service accounts. The forecasts incorporate the effects of existing demand management (conservation) measures, including the effects of plumbing and appliance code provisions, but do not incorporate the effects of the City’s planned additional demand management measures as addressed later in this section.
The City projects its total number of customer accounts would increase by more than 10 percent from 2005 to 2030. However, the City also projects that existing demand management measures would continue to reduce demand per account. Although the number of total accounts would increase, the reduced demand per account means the City’s overall potable water demand would increase by only two percent from 2005 to 2030.\(^1\)

The City has projected growth within its service area, and has included its projections in the 2005 *Urban Water Management Plan* (UWMP). The SUMC Project demand is considered hospital use and not commercial and was not accounted for in the City’s 2005 UWMP. The net increase in demand from the SUMC Project is considered new demand in excess of the City’s existing and planned demands.

In addition to the historical conservation measures included in the above water demand projections, the City has adopted a Demand-Side Management (DSM) Program to further reduce water purchases from SFPUC by four percent by the year 2030. The DSM Program is discussed further in the City’s 2005 UWMP (available for review at the City Utilities Department). Table 3.15-2 includes the projected future demand with DSM through 2030 for the City.

<table>
<thead>
<tr>
<th>Table 3.15-2</th>
<th>Demand Projections with Planned Demand-Side Management (mgd)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
</tr>
<tr>
<td>Total City Demand without Project(^a)</td>
<td>13.36</td>
</tr>
<tr>
<td>Demand Reduction (DSM Program)(^b)</td>
<td>-0.13</td>
</tr>
<tr>
<td>Total City Demand with DSM</td>
<td>13.23</td>
</tr>
</tbody>
</table>


*Notes:*
\(a\). City demand includes unaccounted for water, but not conservation estimates.
\(b\). Based on City of Palo Alto Utilities 2005 Urban Water Management Plan, p. 38.

**City of Palo Alto Water Supply.** The City purchases the majority of its potable water from SFPUC. Palo Alto’s Individual Supply Guarantee (ISG) is 17.07 mgd; this is its share of the 184 mgd allocated for the Bay Area Water Supply and Conservation Agency (BAWSCA) members. The 2005 UWMP projected that the City’s purchases would be approximately 13.00 mgd from SFPUC in 2030.

Table 3.15-3 shows SFPUC’s water allocations for all BAWSCA members in total and for the City individually, as presented in SFPUC’s and the City’s 2005 UWMPs. The table shows allocations for normal years, single dry years, and multiple dry year events. The City’s projected water consumption through 2025 includes planned demand management measures.

### Table 3.15-3
SFPUC Allocations to Palo Alto 2005 / 2025 in Normal, Dry and Multiple Dry Years

<table>
<thead>
<tr>
<th></th>
<th>Normal Year Purchase Request</th>
<th>Normal Year Dry Year</th>
<th>One Critical</th>
<th>Multiple Dry Year Event Year 1</th>
<th>Multiple Dry Year Event Year 2</th>
<th>Multiple Dry Year Event Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mgd</td>
<td>%</td>
<td>mgd</td>
<td>%</td>
<td>mgd</td>
<td>%</td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAWSCA</td>
<td>177.9</td>
<td>100%</td>
<td>153.7</td>
<td>86.4%</td>
<td>153.7</td>
<td>86.4%</td>
</tr>
<tr>
<td>Palo Alto</td>
<td>13.23</td>
<td>100%</td>
<td>12.02</td>
<td>90.9%</td>
<td>12.02</td>
<td>90.9%</td>
</tr>
<tr>
<td>2025</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAWSCA</td>
<td>184.0</td>
<td>100%</td>
<td>152.6</td>
<td>83.0%</td>
<td>152.6</td>
<td>83.0%</td>
</tr>
<tr>
<td>Palo Alto</td>
<td>12.98</td>
<td>100%</td>
<td>12.11</td>
<td>93.3%</td>
<td>12.11</td>
<td>93.3%</td>
</tr>
</tbody>
</table>


Note:


The Interim Water Shortage Allocation Plan governing how available water in a water shortage situation is allocated between San Francisco and the BAWSCA agencies and how the allocation to the entirety of the BAWSCA agencies is divided among the BAWSCA agencies expired on June 30, 2009. The new 25-year Water Supply Agreement, which went into effect on July 1, 2009, stipulates how available water is allocated in a water shortage between San Francisco and the BAWSCA agencies, but not how the water is divided up among the BAWSCA agencies. Under the new Water Supply Agreement, the allocation between San Francisco and the BAWSCA agencies for water shortages of up to 20 percent remains unchanged from the old water contract.

The formula to divide water between the BAWSCA agencies is pending negotiations between the parties. These negotiations could result in changes to the supply allocations and dry-year allocation formulas. The effect of these changes on the City’s allocations is uncertain at this time. If the changes result in reduced drought-time allocations to the City, the City would need to take additional steps to balance supplies with demands, possibly including additional long-term conservation measures and additional utilization of its Water Shortage Contingency Plan which is a part of its UWMP. The need for these additional steps is speculative at this time.

The supply numbers presented in Table 3.15-3 are predicated upon the assumption that SFPUC will achieve its plans to expand recycled water programs, improve conjunctive groundwater uses, and/or increase diversions from the Tuolumne River. These additional supplies, which are necessary to meet

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increased demands in the future, are outlined in SFPUC’s Water System Improvement Program (WSIP). The WSIP is a multiple year, system-wide capital improvements program aimed at improving the SFPUC’s ability to meet its water service goals. Many aspects of the WSIP are rooted in SFPUC’s 2000 Water Supply Master Plan and various water system vulnerability studies.

**SFPUC’s Water System Improvement Program.** SFPUC prepared a Program Environmental Impact Report (PEIR) for the WSIP. Each qualifying project under the WSIP would be subject to specific environmental review and would result in preparation of a CEQA environmental document. Each project would also be reviewed for compliance with any necessary local, State, and federal permitting requirements. The water supply improvement options investigated in the PEIR include:

1. SFPUC Regional Water System Conjunctive Use Program: South Westside Groundwater Basin.
2. SFPUC Regional Water System Water Transfers from the Tuolumne River Districts.

The WSIP also investigated the potential options of developing local water resources, such as water recycling, groundwater, desalination, and improved conservation, to meet SFPUC purchase requests or demands. These resources, which are expected to provide an additional 10 mgd, are potential opportunities that exist throughout the regional water system and could be used to meet customer demands over the next 25 years.3

On October 30, 2008, the San Francisco Planning Commission certified the Final PEIR for the WSIP. At the same time, the SFPUC approved the WSIP including an Interim Water Supply Limitation, which limits water delivered from the SFPUC regional water system to 265 mgd by 2018. Of the 265 mgd limit, the BAWSCA agency limitation is 184 mgd. Individual qualifying projects are still subject to project-level CEQA review.

**Emergency Water Supply and Storage.** The City has approved the development of its Emergency Water Supply and Storage Project (EWSS), which would develop groundwater capacity for use during water supply emergency conditions. The EWSS project would also provide the City the ability to use groundwater during dry years, to partially supplement dry-year supplies from SFPUC. Such use in any given year would be at the discretion of the City Council, with the Council also having the option of increasing demand reduction targets in lieu of using groundwater. This document assumes that the City will use groundwater during multiple dry-year droughts, in addition to dry-year demand reductions, to maintain a positive supply for the City.

In 2002, Carollo Engineers conducted a Groundwater Supply Feasibility Study to “evaluate whether operating one or two of the City’s water wells as active supplies would cause significant decrease in groundwater levels or deterioration in groundwater quality.” The study, completed in April 2003,

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concluded that producing 500 acre-feet per year (AFY) (0.45 mgd) of water from the wells on a continuous basis or 1,500 AFY (1.34 mgd) on an intermittent basis, such as during a drought year, would not result in subsidence, saltwater intrusion, or migration of contaminated plumes. One well producing 1,000 gallons per minute (gpm) would provide 1,500 AFY. Thus, only one or two wells would need to be operated to provide the water quantities identified, if the City Council decided to operate the wells during droughts or on a continuous basis. Currently, the existing wells are only operated once a month to flush the well, verify proper operation of the equipment and to test the quality of the groundwater.

The City completed an EIR for the EWSS projects to improve the distribution system reliability recommended in the 1999 Study (rehabilitation of the existing wells, siting new wells and reservoir facilities). The EIR was certified in March 2007 and is available for review from the City Utilities Department. Mitigation measures were included in the EIR to ensure potential impacts to the groundwater basin would be less than significant. These mitigation measures include aquifer testing for all new and rehabilitated wells. Additional mitigation requires restricted groundwater production following emergency pumping until groundwater levels recover to pre-pumping levels.

**Water Shortage Contingency Plan.** In addition to the Demand Management Measures, the City has developed a Water Shortage Contingency Plan as part of the UWMP to address possible dry-year reductions in supply from SFPUC. The Contingency Plan includes four stages, to be implemented progressively as needed. The 2005 UWMP describes these stages as follows:

- **Stage I** (5% to 10% supply reductions) calls for a low level of informational outreach and enforcement of the permanent water use ordinances.

- In **Stage II** (10% to 20%) there will be a stepped up outreach effort and the adoption of some additional water use restrictions. Drought rate schedules will be implemented.

- **Stage III** (20% to 35%) calls for increased outreach activities and additional emergency water use restrictions. Drought rates in each block would increase from those in Stage II. Fines and penalties would be applied to users in violation of water usage restrictions. In some cases, water flow restriction devices would be installed on customers’ meters.

- **Stage IV** (35% to 50%) requires very close management of the available water supplies. Allocations of water for each customer will be introduced. Informational outreach activities would be operating at a very high level. Severe water use restrictions and a restrictive penalty schedule would be implemented.

The UWMP also notes the City’s history of having successfully achieved necessary demand reductions during past drought events, including the 1990-93 drought when the City’s customers achieved demand reductions of up to 35 percent.

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In considering the potential for dry-year demand reductions, the City notes that these reductions would be over and above long-term conservation savings already achieved in the City, and additional planned long-term conservation savings. The historical and continuing implementation by the City and its customers of water conservation measures results in an effect referred to as “demand hardening.” Demand hardening occurs where implementation of long-term conservation reduces the potential of short-term measures to effect significant reductions in water use.

**Supply-Demand Balance.** During years of above-normal and normal water supplies, the City has sufficient supplies to meet its normal demands. During single and multiple dry year events, City water supplies from SFPUC are insufficient to meet normal demands. These supply deficiencies can be met with the implementation of the WSIP, EWSS projects, and dry year demand reductions in accordance with the Water Shortage Contingency Plan (WSCP).

The City plans to implement its WSCP in progressive stages as needed to achieve a balance of supplies and demands. For the conditions shown in Table 3.15-4, this results in demand reductions of up to 10 percent in a single dry-year and up to 20 percent in subsequent years of a multiple-dry-year event. These reduction levels correspond to implementation Stages I and II, respectively, of the City’s WSCP.

<table>
<thead>
<tr>
<th>2025</th>
<th>Normal Year</th>
<th>One Critical Dry Year</th>
<th>Multiple Dry Year Event</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mgd</td>
<td>%</td>
<td>mgd</td>
</tr>
<tr>
<td>SFPUC Projected Allocation</td>
<td>12.98</td>
<td>100 %</td>
<td>12.11</td>
</tr>
<tr>
<td>Emergency Groundwater</td>
<td>0.00</td>
<td>0 %</td>
<td>0.00</td>
</tr>
<tr>
<td>Palo Alto Normal Demandd</td>
<td>12.98</td>
<td>100 %</td>
<td>12.98</td>
</tr>
<tr>
<td>Dry-Year Demand Reductione</td>
<td>12.98</td>
<td>0 %</td>
<td>11.68</td>
</tr>
<tr>
<td>Palo Alto Reduced Demand</td>
<td>0.00</td>
<td>0 %</td>
<td>0.43</td>
</tr>
<tr>
<td>Surplus/ (Deficit)</td>
<td>0.00</td>
<td>0 %</td>
<td>0.43</td>
</tr>
</tbody>
</table>


**Notes:**

a. Normal year SFPUC Projected Allocation set equal to the City of Palo Alto’s Individual Supply Guarantee (ISG). In a normal year, SFPUC is able to supply up to the maximum SA for all wholesale customers (this assumes the City of Hayward and others with the ability to grow beyond their SA will remain within their current SA through 2030). SFPUC will not deliver more water than needed to meet demands.


c. Average annual demand. Based on linear increase in demand from mid-2009 to 2015.

d. Palo Alto demand includes Demand Side Management and 0.98 mgd system loss per City of Palo Alto Utilities 2005 Urban Water Management Plan, p. 36. This does not reflect actual unaccounted for water.

e. Dry-Year demand reductions are in addition to ongoing conservation measures.
The EWSS projects would also provide the City the ability to use groundwater during dry years, to partially supplement dry-year supplies from SFPUC. Such use in any given year would be at the discretion of the City Council, with the Council also having the option of increasing demand reduction targets in lieu of using groundwater. Table 3.15-4 shows the City’s supply and demand balance assuming 500 AFY (0.45 mgd) of groundwater is available in Years 2 and 3 of a multiple dry year event to supplement SFPUC deliveries. Groundwater would be pumped from existing rehabilitated wells or from a new well sited at El Camino Park, as discussed in the EIR for the EWSS.6

Assuming the implementation of the WSIP and EWSS projects, the City has adequate supply for its projected demands without exceeding SFPUC projected allocations or the City’s SFPUC ISG.

**SUMC Existing Water Demand and Conservation.** The existing SUMC Sites have a current water demand of approximately 362,000 gallons per day (gpd).7 The SUMC Project sponsors are committed to implementing various water conservation policies and measures in accordance with green building requirements and goals. The SUMC Project sponsors have implemented ongoing water conservation measures at the SUMC, and these conservation measures are discussed further under Impact UT-1.

**Wastewater**

The CPAU oversees a wastewater collection system consisting of over 202 miles of sewer lines.8 Wastewater effluent from the SUMC Sites is routed to the Palo Alto Regional Water Quality Control Plant (RWQCP), where it is treated prior to discharge into the San Francisco Bay.

While the CPAU is responsible for the wastewater collection system, the Palo Alto Public Works Department is responsible for the collection/conveyance of sewage collected and delivered to the RWQCP. In addition to serving the City, the RWQCP serves Mountain View, East Palo Alto, Stanford University, Los Altos, and Los Altos Hills. The RWQCP provides tertiary treatment, including primary and secondary treatment, final filtration, and disinfection.9 Treated effluent is discharged to the San Francisco Bay. The RWQCP is designed to have an average dry weather flow (ADWF) capacity of 39 mgd and an average wet weather flow capacity of 80 mgd.10 According to the City, the RWQCP does not experience any major treatment system constraints and has no planned capacity expansions.11

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6 Any use of groundwater during dry years would require approval from the Palo Alto City Council.
7 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-2.
9 The sewage treatment involves three stages, primary (mechanical), secondary (biological), and tertiary treatment (filtration and ultraviolet radiation). First, the solids are separated from the wastewater stream. Then dissolved biological matter is progressively converted into a solid mass by using water-borne microorganisms. Finally, the biological solids are neutralized then disposed of or re-used, and the treated water may be disinfected chemically or physically (for example by lagoons and micro-filtration).
In 2005, the RWQCP processed approximately 28 mgd of wastewater, or 72 percent of its ADWF capacity. In 2007, 15.3 mgd (39 percent of the ADWF capacity of the treatment plant) was allocated to Palo Alto. The City of Palo Alto’s allocation of 15.3 mgd includes 2.11 mgd which is allocated to the “Stanford University Campus,” but this refers to portions of the campus that are outside the City of Palo Alto—primarily lands in unincorporated Santa Clara County. Excluding Stanford University’s allocation, the City is allocated 13.2 mgd. In the 2006 to 2007 fiscal year, the average annual flow (AAF) for Palo Alto (excluding the “Stanford University Campus” use) was 9.3 mgd. This AAF represents 71 percent of the 13.2 mgd capacity allocated to the City. In other words, the City’s current average annual wastewater generation is 29 percent less than its allocation. According to the City of Palo Alto, the City would not reach its allocated capacity in the foreseeable future. Projected ADWF plant flow in 2025 is estimated to be 30 mgd or 77 percent of the RWQCP’s ADWF capacity, based on the projection of the City’s UWMP.

Because the SUMC Sites are within City boundaries, the SUMC Sites’ wastewater flow is part of Palo Alto flow, not “Stanford University Campus” flow. Existing flow from the SUMC Sites is 0.31 mgd AAF.

Stormwater

Palo Alto’s storm drainage system contains over 550,000 linear feet of pipelines, ranging in size from 8 to 96 inches. The storm drains collect stormwater and convey it primarily to San Francisquito, Matadero, Barron, and Adobe creeks. These creeks ultimately discharge the stormwater to San Francisco Bay. The SCVWD oversees County-wide programs for flood protection and stormwater management. For local lines that connect to the creeks, the City maintains a Storm Drain Master Plan that recommends improvements to be made over a 30-year horizon.

Stanford University owns and operates its own storm drain system, which primarily serves the Stanford University campus. This private network, which is not owned or operated by the City of Palo Alto, serves the Main SUMC Site. Stormwater from the Main SUMC Site is collected along Sand Hill Road and is released into San Francisquito Creek through a 90-inch outfall.

17 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.
Stormwater from the Hoover Pavilion Site is collected by Stanford University’s storm drains, but the water then flows into a 33-inch main owned by the City, enters the City’s storm drain system, and is released into San Francisquito Creek through a 42-inch outfall owned and operated by the City of Palo Alto. As such, both the City’s and Stanford University’s storm drainage systems serve the Hoover Pavilion Site. The stormwater generated in the SUMC Sites is not treated prior to its release to San Francisquito Creek.

### Solid Waste

The City previously contracted collection of garbage, recycling, and composting services to the Palo Alto Sanitation Company (PASCO). PASCO is a private company, located in Palo Alto, whose current contract with the City expired in 2009. Currently, the City is contracted with GreenWaste Recovery Inc., for collection of garbage, recycling, and composting services in the City. GreenWaste Recovery, Inc., is a privately owned solid waste and recycling company that specializes in the collection and processing of residential and commercial trash, yard trimmings, curbside recyclables, food waste, and construction and demolition debris.

In 2006, Palo Alto generated approximately 195,273 tons of solid waste, of which 120,432 tons (62 percent) were diverted from disposal through recycling, reduction, and reuse programs. Table 3.15-5 presents a breakdown of the sources of solid waste. The City uses a one percent annual growth rate to project future waste generation. At this rate, the City would generate 235,911 tons of solid waste in 2025.

<table>
<thead>
<tr>
<th>Source</th>
<th>Percent of Solid Waste Generated by the City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Commercial and Multi-Family Residential</td>
<td>44%</td>
</tr>
<tr>
<td>Industrial</td>
<td>25%</td>
</tr>
<tr>
<td>Single-Family Residential</td>
<td>17%</td>
</tr>
<tr>
<td>Self Haul</td>
<td>14%</td>
</tr>
</tbody>
</table>

*Table 3.15-5: Percentage of City of Palo Alto Solid Waste Generation by Source*

23. The City uses a one percent growth rate, from year to year, to determine future waste generation volume, based on the State Department of Finance’s population growth rate assumption of one percent per year for the City of Palo Alto.
24. Using the compounding formula of $P(1 + r)^t$, where $P = 195,273$ tons of solid waste generated by the City in 2006; $r = 0.01$; and $t =$ time, in 2015 there would be $195,273 (1 + 0.01)^9 = 213,567$ tons of solid waste generated and in 2025 there would be $195,273 (1 + 0.01)^{19} = 235,911$ tons of solid waste generated.
Solid waste from the City is sent to multiple locations that each have their own monitoring schedules and data. As a result, it is not possible to directly compare the solid waste data. Consequently, this analysis uses historical trends to make comparisons. Historically, PASCO vehicles delivered 48,551 tons of solid waste (26 percent of total solid waste generated in the City of Palo Alto that year) to the Sunnyvale Material and Recovery Transfer (SMART) Station, located at 301 Carl Road in Sunnyvale, where it was sorted to remove recyclable goods. Of the waste not sent to the SMART Station, approximately one-half was sent to Kirby Canyon Landfill, a third to the Palo Alto Refuse Disposal Landfill, and approximately ten percent to other disposal sites. The SMART Station, which is owned and operated by the City of Sunnyvale, provides service to the cities of Mountain View, Sunnyvale, and Palo Alto. These three cities have a Memorandum of Understanding (MOU) to utilize the SMART facility that expires in 2021, at which time the cities would negotiate with the City of Sunnyvale to extend the terms of the MOU. The SMART Station processes an average daily tonnage of 1,188 tons, or about 79 percent of its 1,500-ton permitted daily capacity.

All non-recyclable solid waste from the SMART Station is compacted and consolidated in large transfer trailers prior to being trucked to the Kirby Canyon Landfill owned by Waste Management, Inc. (WM Inc.). Recyclable waste is transported to other recycling facilities where it is processed. Historically, approximately 62 percent of the City’s waste was diverted from landfills through recycling and solid waste programs. The City has adopted new “Zero Waste” goals, which strive to divert 73 percent of waste from landfills by 2011 and to divert as much waste from landfills as possible by 2025.

Palo Alto Refuse Disposal Landfill is expected to reach its total permitted capacity of 7.76 million cubic yards (2,095,200 tons) in late 2010. As of May 2009, approximately 150,000 cubic yards (40,500 tons) of refuse fill capacity remains (not including closure cap materials) which correlates into about a year or two operations until airspace depletion depending on the remaining fill rate. Upon closure of the Palo Alto Refuse Disposal Landfill in 2010, it is expected that all non-recyclable solid waste currently delivered to Palo Alto’s landfill would be diverted to various local disposal sites

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25 These totals represent data from 2004.
28 Debbi Sargent, Project Administrator of the SMART Station, electronic communication with PBS&J, March 10, 2008.
29 These totals represent data from 2007.
31 Russell Reiserer, Solid Waste Manager, City of Palo Alto Solid Waste Manager, electronic communication with PBS&J, March 12, 2008.
32 These totals represent data from 2006.
33 Russell Reiserer, Solid Waste Manager, City of Palo Alto Utilities Department, electronic communication with PBS&J, November 21, 2007.
35 Numbers used represent data from 2005.
(including Kirby Canyon Landfill). The lease on the land for Kirby Canyon Landfill expires in 2034.\textsuperscript{36} The Kirby Canyon Landfill is operating at less than 25 percent capacity.\textsuperscript{37} There is approximately 21.6 million tons of remaining solid waste disposal capacity at the Kirby Canyon Landfill, of a total projected capacity of approximately 29 million tons.\textsuperscript{38} Annualized solid waste tonnage received by Kirby Canyon Landfill is approximately 475,000 tons.\textsuperscript{39} At that rate, the Kirby Canyon Landfill would reach capacity in approximately 45.5 years. Using WM Inc.’s planned closure date of 2034, and the remaining capacity of 21.6 million tons of solid waste, it would require an average annual tonnage rate of approximately 864,000 tons per year to reach the landfill capacity within the lease period.\textsuperscript{40}

### Energy

**Electricity.** The CPAU operates its own electric utilities. The City purchases electric power from hydroelectric resources, including those managed by the Western Area Power Administration (WAPA) and the Calaveras Hydroelectric Project, operated by the Northern California Power Agency (NCPA). Other renewable supplies and supplies from the market meet the customer demand. Electricity demand within Palo Alto fluctuates throughout the year, depending primarily on seasonal changes. In 2007, peak annual demand for Palo Alto was 185 megawatts (MW) and average daily energy consumption for the entire City was 2,784 megawatt hours (MWh).\textsuperscript{41} Peak electrical demand is measured as the maximum MW demanded at any instant while daily and annual consumption rates are measured in MWh. The CPAU projections extend to the year 2017. The CPAU projects that the annual electricity demand for the City would be approximately 1.042 million MWh in 2017. Based on the CPAU’s econometric model used to predict future consumption levels of electricity, the CPAU projects that demand is expected to remain relatively constant in the long term after 2017.\textsuperscript{42,43} Additionally, the CPAU projects that the corresponding peak electrical load for the City would be 190 MW in 2017. This relatively constant load projection for the long term is based on growth currently anticipated and

\begin{itemize}
  \item Kirby Canyon Landfill’s lease consists of an initial 10-year term ending in 2014 and two 10-year extensions ending in 2034.
  \item Guy Petraborg, Kirby Canyon Landfill, telephone communication, January 29, 2008.
  \item Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 19, 2008.
  \item Totals represent data from 2005 to 2006.
  \item Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 19, 2008.
  \item Shiva Swaminathan, Senior Resource Planner, Utilities Resource Management Division, City of Palo Alto, electronic communication with PBS&J, November 1, 2007.
  \item The econometric models contain weather and seasonal variables as well as binary variables designed to capture the impact of specific holiday periods. The coefficients of these models are estimated over a period of 5 to 6 years. The past performances of each model are evaluated on a regular basis. Based on specific customer information exogenous variables are sometimes added to take into account the short to medium term expected changes in natural gas and energy consumption due to major new projects coming on or going off line during the 10 year forecast horizon. However, the November 2007 forecast did not include any information about the Stanford University Medical Center or the Stanford Shopping Center. As of November 2007, the econometric model designed to predict the energy purchased at City Gate had been a very accurate predictor of those purchases. Consequently, the model was not changed.
\end{itemize}
does not include potential load increases due to large development projects such as the SUMC Project.  

Palo Alto purchases energy from companies that utilize a number of alternative power sources. During years with normal rainfall, 48 percent of power for the City is derived from hydroelectric power. Other power sources include 38 percent purchased from market sources, 13 percent wind power, and one percent power from landfill gas. Palo Alto has adopted a 10-year energy efficiency plan; one of its goals is to meet up to 33 percent of its electricity needs by the year 2015 through renewable sources of power, such as wind, landfill gas, and solar.

The transmission system delivering electricity to the City consists of three 115-kilowatt (kW) transmission lines. High voltage lines are used for transmission to minimize electrical losses; however, high voltage lines are impractical for distribution lines. The interface between the transmission and distribution lines is made at the electrical substation, which features transformers that decrease the transmission voltage to lower voltages for the distribution systems. The distribution systems then transfer electricity to domestic and commercial consumers. Three transformers at the City’s Colorado substation, with a total capacity of 454 MW, deliver energy to the local transmission system. However, the transmission lines from the City’s substation are only capable of meeting a maximum system demand peak load of 385 MW. Therefore, the citywide peak capacity for Palo Alto is capable of meeting a system demand of approximately 385 MW.

The City’s local distribution feeders from the Quarry Road Substation currently serve the SUMC Sites. Quarry Road Substation transformers have a combined full-load rating of 54 MW. With additional cooling applied, the peak capacity at this station can reach 112 MW. The additional cooling is achieved using currently installed fans that operate over the transformer cooling fins.

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45 A one percent growth rate in the demand for electricity was applied from 2017 to 2025: Using the compounding formula of $P(1 + r)^t$, where $P = 1,042,085$ MWh of electricity projected to be demanded by the City in 2017; $r = 0.01$; and $t =$ time, in 2025 there would be $1,042,085(1+.01)^8 = 1,128,429$ MWh demanded by the City.
46 Market sources include: BP Energy Company, Coral Power L.L.C., and Sempra.
47 Jim Bujtor, Senior Power Engineer, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, June 4, 2008.
48 Jim Bujtor, Senior Power Engineer, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, June 4, 2008.
49 The Quarry Substation full-load rating was converted from mega volt amperes (MVA) to megawatts (MW) by multiplying the MVA by 0.9. This was done to keep units of measurement consistent. Conversation factor was obtained from the CPAU.
50 Jim Bujtor, Senior Power Engineer, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, November 18, 2008.
Natural Gas. Palo Alto operates its own natural gas utilities and purchases natural gas at market-based costs from six suppliers. In 2006, the average gas demand per day for the City was 88,000 therms. The total gas consumed during that same year was approximately 32 million therms. The CPAU’s natural gas projections extend to the year 2016. The CPAU projects that the annual gas demand for the City will be approximately 32.6 million therms by 2016. Based on the CPAU’s econometric model used to predict future consumption levels of natural gas, the CPAU projects that demand is expected to remain relatively constant in the long term after 2016. This relatively constant load projection for the long term is based on growth currently anticipated and does not include potential load increases due to large development projects such as the SUMC Project.

Applicable Plans and Regulations

There are no applicable federal regulations pertaining to utilities. Applicable State and local regulations are identified and discussed below.

State Regulations

SB 610. Senate Bill (SB) 610, Section 21151.9 of the Public Resources Code (which is commonly referred to as the Urban Water Management Plan Code) became effective January 1, 2002. The bill coordinates local water supply and land use decisions to help ensure that California’s cities and counties will have adequate water supplies. SB 610 requires that the applicable public water system, which in this case is the City of Palo Alto, prepare a Water Supply Assessment (WSA) for projects that are subject to CEQA and that meet specified statutory criteria. The WSA evaluates the available water supply for the proposed project, in combination with other existing and planned future uses. The WSA must include, among other information, an identification of existing water supply entitlements, water rights, and water service contracts relevant to the identified water supply for the proposed project.

53 The econometric models contain weather and seasonal variables as well as binary variables designed to capture the impact of specific holiday periods. The coefficients of these models are estimated over a period of 5 to 6 years. The past performance of each model is evaluated on a regular basis. Based on specific customer information, external variables are sometimes added to take into account the short to medium term expected changes in natural gas and energy consumption due to major new projects coming on or going off line during the 10 year forecast horizon. However, the November 2007 forecast did not include any information about the Stanford University Medical Center or the Stanford Shopping Center. As of November 2007, the econometric model designed to predict the energy purchased at the PG&E City Gate had been a very accurate predictor of those purchases. Consequently, the model was not changed. In November 2007, the existing natural gas forecast was revised because a growth of 1.1% in gas purchases had been observed during fiscal year 06-07. This forecast already included an external variable taking into account the expected impact of conservation programs. The forecast was also modified to account for an increase in natural gas consumption at Palo Alto’s Compressed Natural Gas station.
A WSA is required if a proposed project is subject to CEQA review in an EIR or negative declaration and is any of the following: (1) a residential development of more than 500 dwelling units; (2) a shopping center or business employing more than 1,000 persons or having more than 500,000 square feet (sf) of floor space; (3) a commercial office building employing more than 1,000 persons or having more than 250,000 square feet; (4) a hotel or motel with more than 500 rooms; (5) an industrial or manufacturing establishment housing more than 1,000 persons or having more than 650,000 sf or 40 acres; (6) a mixed use project containing any of the foregoing; or (7) any other project that would have a water demand at least equal to a 500 dwelling unit project.

A WSA addressing the SUMC Project has been prepared and approved by the Palo Alto City Council on March 16, 2010. The WSA concluded that the City has adequate water supply to meet the demand of the SUMC Project, assuming implementation of WSIP and EWSS projects and the WSCP. A copy of the WSA has been included as Appendix M for further reference.

SB 7. SB 7 was enacted by the California Legislature and signed into law by the Governor as part of the package of water legislation approved during the special legislative session of November 2009. The bill modifies the California Water Code (commencing with Section 10608) to require water agencies achieve a 20 percent reduction in urban per capita water use by 2020. The 20 percent reduction is relative to a baseline to be determined by each water agency using one of four methodologies described in the law. Water agencies have until July 1, 2011 to develop plans for achieving the required reductions. This timing corresponds with the deadline for water agencies to submit to the state their updated Urban Water Management Plans.

Palo Alto will develop plans for complying with SB 7 as part of its upcoming Urban Water Management Plan update process. The specific measures the City will undertake are uncertain at this time. Because Palo Alto has already achieved reductions in its per capita use over the past 10 years, it is likely the additional reduction required by SB 7 will be less than 20 percent. The City will determine the actual magnitude of its required reduction as part of its upcoming planning process. Any additional reductions in per capita water use achieved by the City will reduce its overall water demands.

AB 939. Title 7.3 of the Government Code (which is commonly referred to as the Integrated Waste Management Act) provides standards to minimize the amount of solid waste that must be disposed of by transformation and land disposal. The State Legislature passed Assembly Bill 939, the California Integrated Waste Management Act of 1989 (AB 939), effective January 1990. Under AB 939, all cities and counties in California were required to divert 25 percent of all solid waste from landfill or transformation facilities by January 1, 1995, and 50 percent by January 1, 2000.

Solid waste plans are prepared by each jurisdiction to explain how each city’s AB 939 plan is integrated with its county plan. The plans must promote in order of priority: source reduction, recycling and composting, and finally, environmentally safe transformation and land disposal. In order to achieve the required waste diversion, Palo Alto has implemented a number of recycling and solid waste programs.
**Title 24 Building Energy Efficiency Standards.** Title 24, Part 6, of the California Code of Regulations (which is commonly referred to as the California Energy Code) includes standards mandating energy efficiency measures in new construction projects. Title 24, Part 6, regulates energy consumed for heating, cooling, ventilation, water, and lighting. It applies to non-institutional and non-residential buildings that are mechanically heated or cooled resulting in directly or indirectly conditioned space, and applies to all such development during all hours of operation, including hours when energy demand is at its peak within the region. The energy efficiency standards are enforced by the county and city building departments when a project applicant submits plans for a building permit.

The new medical office/clinic and research portions of the SUMC Project would be subject to Title 24, Part 6, energy standards; however, these standards would not apply to the hospital components of the SUMC Project, which are subject to distinct building code requirements under the jurisdiction of the Office of Statewide Health Planning and Development (OSHPD). Finally, it should be noted that the California Building Standards Commission and OSHPD have recently approved new energy and other conservation standards as part of the California Green Building Standards Code (Title 24, Part 11, of the California Code of Regulation), but at this juncture compliance with applicable standards is not mandatory.

**Local Regulations**

**Zero Waste Strategic Plan.** The City has adopted “Zero Waste” goals to divert 73 percent of waste from landfills by 2011 and to strive for “Zero Waste” by 2025, which essentially means diverting as much waste as possible from landfills.

The City’s Zero Waste Strategic Plan is intended to guide City officials in the planning and decision making process to achieve Zero Waste goals. The objectives of this Zero Waste Strategic Plan are to identify opportunities to:

- Reduce volume and toxicity of wastes;
- Reuse materials and products;
- Expand recycling and composting services for all sectors and materials;
- Recover materials for their highest and best use; and
- Adopt policies and incentives to help achieve Zero Waste in Palo Alto.

There is currently no legal obligation for companies or organizations, including the SUMC Project, to comply with the City’s Zero Waste Strategic Plan. The Strategic Plan is further discussed under Impact UT-4, later in this section.

**Palo Alto Landscape Water Efficiency Standards.** The City of Palo Alto has adopted by resolution water efficiency standards that apply to any new or renovated landscaping over 2,500 sf in size for
commercial, industrial, institutional, multi-family common area, and City facility projects. The standards require that a maximum water allowance (MWA) be calculated for a proposed landscape project prior to issuing a building or grading permit. The MWA was instituted in accordance with 1992 Assembly Bill 325, which was passed in response to a statewide need to conserve water as the population increases. The MWA may not exceed 80 percent of local reference evapotranspiration per year. The formula for calculating MWA is:

\[
\text{square feet of landscaped area} \times 0.8 \times 43.1 \times 0.00083 = \text{CCF/year};
\]

where CCF is 100 cubic feet, the unit of measure on Palo Alto water meters and water bills. The SUMC Project would be subject to the City’s Landscape Water Efficiency Standards.

**Palo Alto Municipal Code, Requirement to Divert Construction and Demolition Waste from Landfill.** Debris from construction and demolition activities in Palo Alto represents a significant volume of materials deposited in landfills. Palo Alto Municipal Code, Chapter 5.24, contains a Requirement to Divert Construction and Demolition Waste from Landfill Ordinance requiring that a minimum of 90 percent of inert solids (e.g., concrete, asphalt, and rock) and a minimum of 50 percent of the remaining debris generated from construction and/or demolition projects be diverted from landfills through reuse and/or recycling. Unless a written waiver is obtained from the City, covered projects are required to plan, record, and demonstrate that waste prevention measures were practiced using reuse and/or recycling activities. Project applicants are required to submit a Debris Management Plan that estimates the total volume or weight of construction and demolition waste that will be generated and the means that the applicant proposes to use to divert the waste from landfills. Project applicants must also submit documentation demonstrating compliance with the diversion requirements, which may include receipts and weight tags or other records of measurement issued by the City-approved facility accepting the debris for reuse or recycling. Covered projects are defined as those requiring a demolition permit or building permit and whose project value is greater than or equal to $75,000. The SUMC Project would be required to comply with the City’s Requirement to Divert Construction and Demolition Waste from Landfill Ordinance.

**Impacts and Mitigation Measures**

**Methodology**

This evaluation of the effects on utilities as a result of buildout of the SUMC Project is based on a qualitative assessment of the existing utilities, their service characteristics, and their service capacity, measured against the future demand that would be created by the SUMC Project. Baseline data was


\[56\] Evapotranspiration is a measure of the amount of water evaporated from the soil surface and transpired by the leaves of a reference crop, in this case, turf. It is the amount of water required to maintain 4- to 6-inch tall turf grass in an open field in full sun. In Palo Alto it takes 43.1 inches of water per square foot per year to maintain a tall stand of turf.

derived using a variety of sources, including such documents as the City’s *2005 Urban Water Management Plan*, Comprehensive Plan EIR, and Storm Drain System Maps. PBS&J communicated directly with the City’s utility providers and internal departments (e.g. Public Works, Planning) where no previous and/or current documentation exists.

**Standards of Significance**

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant utilities impact if it would:

- Exceed wastewater treatment requirements of the Regional Water Quality Control Board (RWQCB);
- Require or result in the construction of new stormwater or wastewater facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments;
- Need new or expanded entitlements for water supplies;
- Be served by a landfill with insufficient permitted capacity;
- Result in adverse physical impacts from new or expanded utility facilities required to provide service as a result of the project; or
- Result in a substantial physical deterioration of a utility facility due to increased use as a result of the project.

**Environmental Analysis**

**UT-1. Water Demand.** The SUMC Project would result in a less-than-significant water supply impact because it would not result in the need for new or expanded entitlements for water supplies, and would not require expansion or construction of water facilities. (LTS)

This analysis is based on the WSA for the SUMC Project (Appendix M).

The SUMC Project would generate increased water demand from the operation of the hospitals, medical clinics and offices, and research facilities. The existing SUMC Sites have a current water demand of approximately 362,000 gallons per day (gpd).58 As a result of the SUMC Project, water demands on the SUMC Sites would increase by approximately 177,000 gpd, to a total of approximately 539,000 gpd.59

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58 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-2.
59 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-2.
The SUMC Project would result in a net increase in the City’s total water demand of 0.18 mgd, or 1.4 percent, which would bring total demand in 2030 to 13.18 mgd. The SUMC Project’s demand would not exceed Palo Alto’s ISG of 17.07 mgd from the SFPUC.

During years of above-normal and normal water supply, the City has sufficient supplies to meet the demands of the SUMC Project. During single and multiple dry years, City water supplies from SFPUC are insufficient to meet demands. These supply deficiencies can be met with the implementation of the WSIP, EWSS projects, and dry year demand reductions in accordance with the WSCP.

The City plans to implement its WSCP in progressive stages as needed to achieve a positive balance of supplies and demands. Table 3.15-6 shows a comparison of citywide supply and demand, including implementation of the SUMC Project. For the conditions shown in Table 3.15-6, this results in demand reductions of up to 10 percent in a single dry-year and up to 20 percent in subsequent years of a multiple-dry-year event. These reduction levels correspond to implementation Stages I and II, respectively, of the City’s WSCP. Given the broad range of conservation measures and the City’s historical ability to achieve the targeted demand reductions through largely voluntary measures, it is not anticipated that Stage I or II reduction levels would have any secondary environmental impacts nor would implementation of such measures necessitate new or expanded entitlements for water supplies.

Supplies are sufficient to meet the demands of the SUMC Project at 2025 full buildout and operation. The SUMC Project would not require the City to create new or expanded entitlements for water supplies. Therefore, development of the SUMC Project in 2025 would have a less-than-significant impact on water supply.

The City’s existing water transmission facilities have adequate capacity available to serve the increased demands of the SUMC Project. Consequently, the SUMC Project would not cause the existing water supply facilities to experience substantial physical deterioration that would cause the need for their replacement. Normal general maintenance and replacement of aged facilities would be expected as part of existing maintenance plans, and any substantial maintenance activities would be subject to environmental review. Therefore, the construction of the SUMC Project at full buildout would result in a less-than-significant impact related to the deterioration of water supply facilities.

**IMPROVEMENT MEASURES.** Although the SUMC Project would not need new or expanded entitlements for water supplies and would have a less-than-significant impact related to water demand, there are measures the City could encourage the SUMC Project sponsors to implement or consider imposing as conditions of approval. These measures would help reduce the actual water demands of the SUMC Project to below projected levels, and would thereby reduce the extent to which the City would need to implement its Water Shortage Contingency Plan during dry-year supply reductions from SFPUC.
### Table 3.15-6
Supply Demand Comparison - SUMC

<table>
<thead>
<tr>
<th>Year</th>
<th>Normal Year⁹</th>
<th>One Critical</th>
<th>Multiple Dry Year Event⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mgd</td>
<td>%</td>
<td>mgd</td>
</tr>
<tr>
<td><strong>2005</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SFPUC Projected Allocation</td>
<td>13.23</td>
<td>100%</td>
<td>12.02</td>
</tr>
<tr>
<td>Emergency Groundwater</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Dry-Year Demand Reduction</td>
<td>0.00</td>
<td>0%</td>
<td>0.13</td>
</tr>
<tr>
<td>Surplus/(Deficit)</td>
<td>0.00</td>
<td>0%</td>
<td>0.13</td>
</tr>
<tr>
<td><strong>2025</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SFPUC Projected Allocation (with SUMC Project)</td>
<td>13.16</td>
<td>100%</td>
<td>12.17</td>
</tr>
<tr>
<td>Emergency Groundwater</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>SUMC Demand</td>
<td>0.18</td>
<td>0.18</td>
<td>0.18</td>
</tr>
<tr>
<td>Dry-Year Demand Reduction</td>
<td>0%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Total Reduced Demand</td>
<td>13.16</td>
<td>11.84</td>
<td>11.84</td>
</tr>
<tr>
<td>Surplus/(Deficit)</td>
<td>0.00</td>
<td>0%</td>
<td>0.33</td>
</tr>
</tbody>
</table>


Notes:

a. In a normal year, SFPUC is able to supply the maximum Supply Assurance (SA) for all retail and wholesale customers (this assumes the City of Hayward and others with the ability to grow beyond their SA will remain within their current SA through 2030). SA for Palo Alto is 17.07 mgd. However, SFPUC will not deliver more water than needed to meet demand. As a result, the projected SFPUC allocation does not exceed normal year demand.


c. Palo Alto demand includes demand side management and 0.98 mgd system loss per City of Palo Alto Utilities 2005 Urban Water Management Plan, p. 36. This does not reflect actual unaccounted for water.

d. Average annual demand. Based on SUMC Project demand at buildout. Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-2.
Stanford has identified a long list of conservation measures that it proposes to implement to help reduce the water demands of the SUMC project. The City may impose these measures as conditions of approval. These improvement measures include the following.\textsuperscript{60}

**SHC and LPCH.** The SHC and LPCH components of the SUMC Project should contain various water-saving features:

- The buildings should use automatic sensors on faucets and urinals throughout the hospitals and clinics buildings. These devices would ensure that people do not leave the water running when it is not necessary to do so.
- Low-flow fixtures should be used throughout the facilities. The SHC and LPCH components of the SUMC Project would seek to optimize the reduced water flow requirements with operational necessities for a hospital.
- Dual-flush and/or high-efficiency toilets should be used. These toilets use an average of 1.28 gallons per flush, as compared to 1.6 gallons per flush for new toilets as required by the Uniform Plumbing Code.
- The buildings should employ minimal use of water-cooled equipment such as ice-makers and when such equipment is used, it would be water-efficient.
- The buildings should not use once-through water-cooled equipment, such as sterilizers and imaging equipment that use potable water once and discharge it to the drain.
- Anti-microbial hand-rinse pumps and water efficient sterilizers with water recirculation and automatic shut-off should be used to reduce the need for handwashing.
- Where possible, the buildings should use EPA-labeled WaterSense fixtures. These devices use optimally low amounts of water, compared to conventional equipment.
- Minimizing the use of water for landscaping has been and should continue to be an overarching design principle of the SHC and LPCH components of the SUMC Project, and the hospitals would not increase water use for landscaping.
- The landscaping should be designed to make maximum use of drought-tolerant, native planting to minimize the water consumed in irrigation.
- In accordance with existing practice, landscape irrigation should be continually adjusted to match the season’s progress. Watering would be reduced as the weather cools and would be turned off as soon as the rains begin.
- The hospitals’ grounds team should use mulching lawn mowers that recycle grass clippings into the lawns. This would help the soil to retain moisture, which reduces the need for irrigation water.

\textsuperscript{60} Philips, William T., Memo from the Applicant to the City, \textit{Water Supply Assessment for Stanford University Medical Center}, April 28, 2009.
• The grounds team also should make extensive use of bark mulch (generated by Stanford University tree pruning and provided to SUMC free of charge) to mulch the grounds, which would further help the soil to retain moisture and reduce the need for irrigation water.

**SoM.** With respect to the use of water, the SoM component of the SUMC Project should target water use reduction by 25 percent:

• The buildings should use automatic sensors on faucets and urinals.

• Low-flow fixtures should be used throughout the facilities.

• Dual-flush and/or high-efficiency toilets, or recycled water should be used for toilets and urinals.

• The buildings should employ minimal use of water-cooled equipment such as ice-makers and when such equipment is used, it would be water-efficient.

• The buildings should not use once-through water-cooled equipment, such as sterilizers, vacuum pumps and imaging equipment that use potable water once and discharge it to the drain.

• Anti-microbial hand-rinse pumps and water efficient sterilizers with water recirculation and automatic shut-off should be used to reduce the need for handwashing.

• Use of water for landscaping should be minimized.

• The landscaping should be designed to make maximum use of drought-tolerant, native planting to minimize the water consumed in irrigation.

• In accordance with existing practice, landscape irrigation should be continually adjusted to match the season’s progress. Watering should be reduced as the weather cools and would be turned off as soon as the rains begin.

• The grounds team should use mulching lawn mowers that recycle grass clippings into the lawns.

• The grounds team also should make extensive use of bark mulch (generated by Stanford University tree pruning and provided to SUMC free of charge) to mulch the grounds, which further helps the soil to retain moisture and reduce the need for irrigation water.

**UT-2. Wastewater Generation.** The SUMC Project would result in a less-than-significant wastewater impact because it would not exceed treatment requirements of the RWQCB, would not significantly increase use of the wastewater disposal system, and would not require expansion or construction of wastewater collection or treatment facilities. (LTS)

Although the amount of wastewater generated by SUMC would increase, the type of uses and the controls for wastewater at SUMC would remain the same, so the wastewater constituents would not change from current conditions. All wastewater from the SUMC Project would flow
to the RWQCP, where it would be treated prior to being discharged into San Francisco Bay. The RWQCP operates under National Pollutant Discharge Elimination System (NPDES) Permit CA0037834, which requires the RWQCP to conduct effluent monitoring and mandatory reporting requirements. The permitted amount of outflow wastewater for the RWQCP is an ADWF of 39 mgd, which is the amount of wastewater the RWQCP can process and release in a day while still meeting the RWQCB’s wastewater treatment requirements. Therefore, because the RWQCP has adequate capacity to process the wastewater generated from the SUMC Project, the SUMC Project would not exceed the wastewater treatment requirements of the RWQCB.

The SUMC Project would generate increased wastewater from the operation of the hospitals, medical clinics and offices, and research facilities. The existing SUMC Sites currently generate 310,600 gpd of wastewater.\(^61\) As a result of the SUMC Project, the SUMC Sites in 2025 are projected to generate 573,550 gpd of wastewater, resulting in a net increase of 262,950 gpd of wastewater.\(^62\) In the 2006 to 2007 fiscal year, the CPAU estimated that the City produced an ADWF of 9.3 mgd of wastewater, which is approximately 71 percent of its allocated volume of 13.2 mgd.\(^63\) With the SUMC Project, the total wastewater flow from the City of Palo Alto to the RWQCP would be 9.56 mgd.

The SUMC Project would not substantially increase the wastewater flow to the RWQCP. The RWQCP currently receives approximately 28 mgd of wastewater and operates at 28 percent below the plant’s capacity of 39 mgd. In 2025, the RWQCP is projected to receive 30 mgd of wastewater and to operate at 23 percent below capacity. In 2025, the net increase in wastewater demand resulting from the SUMC Project (262,950 gpd) would be less than one percent of the total amount of wastewater received by the RWQCP in that year and less than 3 percent of the plant’s remaining capacity of 9 mgd. Therefore, operation of the SUMC Project at 2025 full buildout would generate wastewater volumes that would be within RWQCP capacity and the SUMC Project would not require the City to implement wastewater infrastructure improvements.\(^64\) Therefore, development of the SUMC Project in 2025 would have a less-than-significant impact on wastewater treatment plant infrastructure.

The City projects that wastewater for the SUMC Project would be routed through a 15-inch wastewater pipe beneath Welch Road, an 18-inch pipe beneath Quarry Road, and then a 24-inch pipe beneath Palo Road. The pipes beneath Welch Road and Quarry Road are just outside the Main SUMC Site, and the pipe beneath Palo Road is just outside the Hoover Pavilion Site. Stanford University implemented a wastewater flow monitoring program that confirmed the

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\(^61\) Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.
\(^62\) Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.
primary 24-inch wastewater main that serves the SUMC Sites has adequate capacity to serve the SUMC Project. The City, in consultation with RMC Water and Environment, ran a hydraulic model, which concluded that the primary wastewater main serving the SUMC Sites would have adequate capacity to serve the SUMC Project. In addition, the SUMC Project sponsors would be responsible for working with the CPAU, as part of the routine development review process, to ensure that the existing wastewater collection and pipeline system serving the SUMC Sites could accommodate wastewater generated by the SUMC Project at full buildout. The wastewater mains serving the SUMC Sites run along Sand Hill Road, Welch Road, Arboretum Road, and Quarry Road. If any collection and pipeline system upgrades would be needed to serve the SUMC Project, the SUMC Project sponsors would be responsible for construction or providing funding for those system upgrades. Consequently, construction of the SUMC Project would not result in the need for additional wastewater treatment or conveyance facilities beyond those already identified for the SUMC Project. Therefore, the SUMC Project at full buildout would not require additional infrastructure, the construction of which could result in physical impacts.

As described in the analysis above, the SUMC Project would not require the expansion or installation of new wastewater facilities. Wastewater generated by the SUMC Project is within the capacity of the existing system; therefore, it is unlikely that the SUMC Project would contribute to any premature physical deterioration of the wastewater system. Consequently, the SUMC Project would not cause the existing wastewater facilities to experience substantial physical deterioration that would cause the need for their replacement. It should be noted that normal general maintenance and replacement of aged facilities would be expected as part of existing maintenance plans, and that any substantial maintenance activities would be subject to environmental review. Therefore, the construction of the SUMC Project would result in a less-than-significant impact related to the deterioration of wastewater facilities.

**UT-3. Stormwater Generation.** The SUMC Project would have a less-than-significant impact related to stormwater collection system capacity because it would not significantly increase use of the stormwater collection system, and would not require expansion or construction of new stormwater facilities. (LTS)

Stanford University’s stormwater conveyance system serves the SUMC Sites. Stanford University’s 90-inch diameter main that currently serves the SUMC Sites has adequate capacity to convey the 6-hour 10-year storm event without flooding. The storm drains convey stormwater to the nearby San Francisquito Creek. As discussed in Section 3.11, Hydrology, under Impact HW-4, the SUMC Project would not substantially alter site topography, impervious surfaces, surface stormwater runoff, or the local storm drainage system. The SUMC Site surface is currently about 27 percent pervious land surfaces with about 3 percent of

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66 Catherine Palter, Associate Director, Land Use and Environmental Planning, Stanford University, electronic communication with PBS&J, March 13 2008.
green roofs. Implementation of the SUMC Project would ultimately create about 26 percent pervious land surfaces and about 11 percent of green roofs. Green roofs can detain 60 to 100 percent of precipitation, depending upon the substrate and size of storm event. The increased amount of pervious surfaces (land surface plus green roof area; a 7 percent total increase in pervious surfaces) would reduce the amount of stormwater runoff from the SUMC Project compared to existing conditions. Per design guidelines for the SUMC Project, impervious surfaces and surface runoff would not be increased. Accordingly, the SUMC Project would not increase flood-flow rates or alter flood flow conveyance capacity. Therefore, full buildout of the SUMC Project would not generate stormwater that would exceed flooding and stormwater conveyance capacity.

As described in the analysis above, the existing stormwater facilities serving the SUMC Project have adequate capacity to convey the 6-hour 10-year storm event without flooding. Also, the SUMC Project would increase pervious area and thereby decrease runoff. Therefore, the SUMC Project would not require the expansion or installation of new stormwater facilities and the existing stormwater facilities would not experience substantial physical deterioration that would cause the need for their replacement. Therefore, the construction of the SUMC Project at full buildout would result in a less-than-significant impact related to the deterioration of stormwater facilities.

UT-4. Solid Waste Generation. The SUMC Project would result in a less-than-significant solid waste impact because it would be served by landfills with sufficient capacity and, thus, would not contribute to the need to expand existing or construct new solid waste disposal facilities. (LTS)

The increases in employees and patient visits associated with development at the SUMC Sites would result in a net increase of solid waste generated, compared to existing conditions. Currently, the Main SUMC Site generates 4,730 tons of solid waste per year. However, 1,030 tons, approximately 22 percent, of that solid waste is recycled. Therefore, the Main SUMC Site generates approximately 3,700 tons of non-recyclable solid waste each year. This is equal to approximately 4.14 pounds per gross square foot per year (lbs/gsf/year). The SUMC Project would result in approximately 1.3 million additional square feet on the SUMC Sites. However, approximately 446,000 square feet of the 1.3 million square feet would be for right-sizing, which would allow relocation of existing services into more appropriately sized (larger) areas (see Section 2, Project Description). Therefore, although the square footage would be increased, generation of additional solid waste would not be expected to occur as a result of the right-sizing because operations would not be expanded in these areas relative to existing operations. After adjusting for right-sizing, the SUMC Project would result in a net

68 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 4,Tables 4-8(a) and 4-8(b).
69 Catherine Palter, Associate Director, Land Use and Environmental Planning, Stanford University, electronic communication with PBS&J, November 21, 2008.
increase of 865,441 square feet (see Table 2-7 in Section 2, Project Description). This square footage was calculated by subtracting the square footage needed for the SUMC to meet current requirement standards from the total net new square footage proposed for the SUMC Project. If the 4.14 lbs/gsf/year is applied to the net increase in square footage (adjusted for rightsizing), and, as expected, the recycling programs on the SUMC Sites continue to recycle a similar percentage of their total solid waste generated through 2025, the total increase in solid waste generated by the SUMC Project would equal approximately 1,625 tons per year. The net increase of 1,625 tons per year from the hospitals and medical offices would be approximately 0.8 percent of the existing 195,273 tons per year of solid waste generated by the City.\(^\text{70}\) The City would generate 235,911 tons of solid waste in 2025.\(^\text{71}\) The 1,625 tons per year of solid waste would be approximately 0.7 percent of the City’s projected total solid waste generation in 2025.

The Kirby Canyon Landfill and SMART recycling center have sufficient capacity to accommodate the SUMC Project’s increase in solid waste. From 2006 to 2007, the SMART Station on average had 21 percent of its permitted daily capacity remaining. The SMART Station received an average daily tonnage of 1,188 tons, or about 79 percent of its 1,500-ton permitted daily capacity from 2006 to 2007.\(^\text{72}\) Conservatively assuming the net increase of solid waste generated at the SUMC Site is processed at the SMART Station, the SMART Station’s daily tonnage would increase by 4.4 tons, for a total of approximately 1,192.4 tons. The SUMC Project would require approximately 1.4 percent of the SMART Station’s remaining daily capacity of 312 tons per day.

Kirby Canyon Landfill currently contains 6.5 million cubic yards of solid waste. The Landfill is therefore operating at less than 25 percent capacity and has approximately 21 million cubic yards of remaining capacity.\(^\text{73}\) As explained above, it is expected that the lease on the land for the landfill will be extended until at least 2034. Given the large amount of remaining capacity, Kirby Canyon Landfill would be able to accommodate the additional 1,625 tons per year (or 4.4 tons per day) of solid waste generation from the SUMC Project.

Since the SMART Station and Kirby Canyon landfill are projected to have available capacity, the SUMC Project would not require expansion of solid waste disposal facilities. In addition, the SUMC Project would include recycling activities that would reduce the amount of solid waste the SUMC Project would generate, which would further reduce the amount of solid waste sent to the landfill. Therefore, the SUMC Project would result in a less-than-significant solid waste impact.


\(^{71}\) Using the compounding formula of \(P(1 + r)^t\), where \(P = 195,273\) tons of solid waste generated by the City in 2006; \(r = 0.01\); and \(t = \) time, in 2015 there would be \(195,273 (1 + 0.01)^9 = 213,567\) tons of solid waste generated and in 2025 there would be \(195,273 (1 + 0.01)^{19} = 235,911\) tons of solid waste generated.

\(^{72}\) The SMART Station is permitted to process solid waste on a tonnage per day basis, rather than a tonnage per year basis.

\(^{73}\) Guy Petraborg, Kirby Canyon Landfill, telephone communication, January 29, 2008.
The construction of the SUMC Project, throughout the construction period, would generate an undetermined amount of solid waste, including demolition debris. However, construction of the SUMC Project would be subject to the Requirement to Divert Construction and Demolition Waste from Landfill Ordinance (Palo Alto Municipal Code 5.24). This ordinance requires that a minimum of 90 percent of inert solids (e.g., concrete, asphalt, and rock) and a minimum of 50 percent of the remaining debris, generated from construction and demolition projects, be diverted from landfills through reuse and/or recycling.

Because the Kirby Canyon Landfill and the SMART Station have sufficient remaining capacity to serve the SUMC Project, it is not expected that the SUMC Project would cause the need for expansion or replacement of solid waste facilities. Therefore, the SUMC Project at full buildout would result in a less-than-significant impact related to insufficient landfill capacity or the need to construct or expand solid waste facilities.

In addition, the SUMC Project sponsors have identified the following recycling efforts that they currently are implemented or would implement as part of the SUMC Project.\[74\]

**SHC and LPCH.** The hospitals currently have programs in place to reduce the amount and toxicity of waste:

- The hospitals have made it a policy to come as close as possible to mercury free. In the process, the hospitals have eliminated a significant amount of waste.
- In 2001, the hospitals implemented a fluorescent lamp recycling program. In fiscal year 2007, 8.8 tons (17,643 pounds) were recycled as a result of the program.
- In 2001, the hospitals implemented a battery collection program. There are over 35 designated “Battery Recycling” collection locations throughout the medical center. In fiscal year 2007, 8.0 tons (15,938 pounds) of batteries were recycled.
- The hospitals began an E-waste recycling program in 2002. In fiscal year 2007, the hospitals recycled 7.3 tons through Zak Enterprises, one of the original 15 recyclers in the U.S. to endorse “The Recyclers Pledge of True Stewardship” as drafted by the Basel Action Network, an international organization focused on halting the export of toxic materials.
- The Surgical Pathology department has treated Formalin (a fixative) waste with NeutraLex® for over seven years. Instrumentation and automation upgrades use fewer chemicals and produce less chemical waste.
- All of the cardboard generated from the hospitals’ primary supplier of medical supplies is recycled by the supplier.
- The hospitals return all toner and inkjet cartridges to the supplier for recycling.

\[74\] Barbara Schussman, Memo from the SUMC to the City, dated December 5, 2008.
SoM. Campus-wide, Stanford University currently is engaged in numerous initiatives to reduce waste, including the following:

- Paper, cardboard, cans, glass, and plastics are all collected in recycling bins on the Stanford University campus. The SoM recycles paper, cans, glass, plastic, batteries, and printer cartridges.
- A lab glass recycling program recently has been started.
- Food waste is composted, which reduces waste and the use of water for garbage disposals.
- The University mulches brush and tree trimmings for use on campus, comports yard waste from residences and other buildings, and leaves mowing trimmings behind to replenish nutrients in lawn areas.
- Building materials, dirt, and other debris from construction and demolition are recycled and reused whenever possible.
- Compostable serviceware is provided at events.
- Electronic equipment is resold or recycled.
- Batteries are collected and recycled.
- Cell phones, PDAs, chargers, CDs, and other small electronics are collected from academic buildings and residences.
- Stanford has a “Surplus Chemical Program” exchange that gives researchers a direct means of improving the environment by reducing the volume of chemicals purchased and disposed of as waste.
- In 2007, Stanford recycled, reused, or composted:
  - 5,855 tons of organic material
  - 829 tons of glass, metal, and plastic
  - 3,095 tons of paper
  - 236 tons of electronic waste
  - 3,171 tons of construction and demolition debris

In addition, Section 3.6, Climate Change, lists measures that the SUMC Project sponsors are implementing to reduce waste through purchasing decisions, reuse of materials and equipment, use of building materials and products that generate less waste than comparable materials and products, and other programs designed to minimize waste. These programs are furthering the goals of the City’s Zero Waste Strategic Plan. Based on the significance criteria previously identified in this section, the SUMC Project would have a less-than-significant impact related to solid waste generation.
Energy Demand. Although the SUMC Project is an urban infill project and would not require the expansion of natural gas facilities and would use existing utility facilities, it may require the installation of near-site electrical facilities and natural gas pipelines to accommodate the projected additional demand. However, this installation is included in the SUMC Project and no additional off-site construction relating to electrical and natural gas facilities would occur. Therefore, the SUMC Project would have a less-than-significant impact related to the construction of energy facilities. (LTS)

Electricity. The SUMC Sites are already developed and connected to the CPAU’s electrical and natural gas infrastructure. Although the SUMC Sites are already developed and connected to CPAU’s electrical system, according to the City’s Electric Engineering Manager, the SUMC Project may require additional electrical feeder cables to supply its increase in electricity demand. As discussed in Section 2, Project Description, the SUMC Project would include installation of these cables; these improvements are assumed as part of the SUMC Project and are analyzed throughout this EIR. The construction mitigation measures found throughout this EIR would apply to the installation of the feeder cables.

According to the SUMC application, it is estimated that the SUMC Project at full buildout would have a net increased peak demand of 9.04 MW, or a new total peak demand of 20.2 MW. This net increase is less than five percent of the City’s 2007 peak load demand of 185 MW and also less than five percent of the City’s remaining peak load capacity of 200 MW. Consequently, the SUMC Project would not require the construction of additional electrical facilities beyond those disclosed in the Section 2, Project Description. Therefore, the SUMC Project would have a less-than-significant impact related to the construction of new electric distribution facilities.

The SUMC Project would increase average daily consumption of electricity by 148.7 MWh, which is less than six percent of the City’s daily electrical consumption of 2,784 MWh in 2007. Although the SUMC Project may require the installation of additional electrical feeder cables, the City’s existing electrical facilities would not experience a substantial increase in usage due to the SUMC Project such that it would result in deterioration of facilities. Thus, the existing electrical facilities serving the SUMC Site would not experience substantial physical deterioration that would cause the need for their replacement. Therefore, the

75 Jim Bujtor, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, November 18, 2008.
76 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.
77 Jim Bujtor, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, June 4, 2008.
78 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6.
80 Jim Bujtor, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, December 12, 2008.
construction of the SUMC Project at full buildout would result in a less-than-significant impact related to electrical facilities.

**Natural Gas.** The SUMC Project obtains natural gas from CPAU. The SUMC Project at full buildout is expected to have a net increase in peak natural gas demand of 12 therms.\(^81\) Based on the capacity of the natural gas facilities serving the SUMC Project, this demand for natural gas is minor.\(^82\) As a result, the CPAU has determined that the SUMC Project’s demand would not necessitate the installation of new or expansion of its existing natural gas facilities.\(^83\) However, it is possible that pipeline extensions would be needed near the SUMC Sites to serve the new buildings. These extensions would be within roadways and other developed areas. Therefore, the SUMC Project would have a less-than-significant impact on natural gas facilities.

For those portions of the SUMC Project subject to the California Energy Code (Title 24, Part 6, of the California Code of Regulations), construction would need to conform to the applicable energy conservation standards. Title 24, Part 6, regulates energy consumed for heating, cooling, ventilation, water, and lighting and applies to non-institutional and non-residential buildings that are mechanically heated or cooled resulting in directly or indirectly conditioned space, and it would apply to all such development during all hours of operation, including hours when energy demand is at its peak within the region. The new medical office/clinic and research facility portions of the SUMC Project would be subject to Title 24, Part 6. Title 24, Part 6, would not apply to the hospitals, which are subject to distinct building code requirements under the jurisdiction of OSHPD.

Because the SUMC Project would not result in a substantial change in the amount of natural gas usage in the City, the City’s existing natural gas facilities would not experience a substantial increase in usage due to the SUMC Project such that it would result in deterioration of facilities that would cause the need for their expansion or replacement. Therefore, the construction of the SUMC Project at full buildout would result in a less-than-significant impact related to natural gas facilities.

**Proposed Energy Conservation Measures.** The SUMC Project sponsors have included the following measures to reduce energy consumption associated with SUMC Project operations beyond the levels otherwise required by Title 24 and OSHPD requirements.\(^84\)

**SHC and LPCH.** As part of the proposed SUMC Project, the SHC and LPCH components of the SUMC Project would be designed to achieve EnergyStar scores of 90-95, which means they would perform better than 90-95 percent of similar hospitals. The buildings would use 35

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\(^81\) Stanford University, response to Data Request 4, February 20, 2008.

\(^82\) Greg Scoby, Senior Project Engineer, Utilities Department Water Gas Wastewater Engineering, communication with PBS&J, April 22, 2008.

\(^83\) Greg Scoby, Senior Project Engineer, Utilities Department Water Gas Wastewater Engineering, electronic communication with PBS&J, April 22, 2008.

\(^84\) Barbara Schussman, Memo from the SUMC to the City, dated December 5, 2008.
percent less energy than typical hospitals (based on a comparison to DOE’s Commercial Buildings Energy Consumption Survey). Specific measures to achieve this level of conservation are set forth below.

Independent from the proposed SUMC Project, the hospitals’ Engineering & Maintenance department is engaged in numerous conservation initiatives:

- The department has instituted a bulb-wattage improvement campaign, changing to electronic ballasts along with more energy efficient florescent bulbs, starting in all public areas. In FY 2007, the department purchased and installed over 8,000 T-8 bulbs, connected to over 500 new electronic ballasts. The department is also replacing burned out incandescent bulbs with compact florescent lights.

- Seven years ago, the department changed from light switches in all mechanical spaces to light timer switches. Four years ago, the department improved this practice by changing to digital switches with motion-detection devices.

- Ten years ago, the department began changing out air handler motors to Variable Frequency Drives (VFDs) during equipment replacement and upgrade efforts.

- The department is beginning to replace lighted exit signs with LED or phosphorescent exit signs.

- The department has enrolled in the City of Palo Alto’s Compressed Air Management Program (CAMP) and will complete an analysis for potential further energy savings.

SoM. As part of the SUMC Project, the SoM component of the SUMC Project would meet Stanford University’s 2008 Building Performance Guidelines, which set a target energy efficiency in new buildings of 30 percent below California Title 24.

- These buildings would feature a combination of state-of-the-art energy efficiency measures to achieve these goals, including exterior sunshades to reduce solar loads, highly insulated building shells and fenestration, building-level heat recovery, high efficiency building lighting systems, high efficiency HVAC equipment, use of passive cooling, and smart building technology to coordinate building systems operation with occupancy and use patterns. These buildings would be provided with full energy metering and energy use would be closely monitored after commissioning to assure that building systems are operating as intended and that energy goals are being met.

Given the above points, the SUMC Project would have less-than-significant impacts related to energy consumption.

**Cumulative Analysis**

The geographic context for a discussion of cumulative impacts to utilities is the service area of the utility in question. For instance for cumulative impacts, the following are geographic contexts for various utilities:
- Water supply: the CPAU service area (City of Palo Alto);
- Wastewater: the RWQCP’s service area (cities of Mountain View, East Palo Alto, Los Altos, and Los Altos Hills, and Stanford University);
- Storm drainage system: the City of Palo Alto and the Stanford University campus;
- Solid waste: the Kirby Canyon Landfill service area (San Francisco Bay Area) and the SMART Station service area (cities of Mountain View, Sunnyvale, and Palo Alto); and
- Electricity/natural gas consumption: the CPAU service area (City of Palo Alto).

The cumulative impacts analysis for each utility includes all cumulative growth within its respective service area by 2025 or, if projections for 2025 are not available, the closest projections to 2025. The anticipated cumulative growth for Palo Alto is based upon projected future demands prepared by the respective service providers, as presented under Existing Conditions.

**UT-6. Cumulative Water Impacts.** Since the City has sufficient water supply to accommodate water demands for cumulative development up to 2025, new or expanded entitlements for water supplies are not necessary. Therefore, cumulative development would have a less-than-significant cumulative impact related to water supply. (LTS)

As discussed in the Existing Conditions section, City demand projections include growth beyond current demands, but do not specifically include the increased demand from the SUMC Project.

In 2025, the City is projected to request 12.98 mgd of water from SFPUC. In 2025, the net increase in water demand resulting from the SUMC Project would be 1.4 percent of the total demand supplied to the City in that year. The SUMC Project’s demand would not exceed Palo Alto’s Supply Assurance of 17.07 mgd from the SFPUC.

During above-normal and normal years, the City has sufficient water supplies to meet the demands of the City under projected 2025 conditions. During single- and multiple-dry-years, City water supplies from SFPUC are insufficient to meet these demands. However, these supply deficiencies would be met with the implementation of the WSIP, EWSS projects, and dry year demand reductions in accordance with the WSCP. Under existing and projected future conditions, and with implementation of the SUMC Project, the City projects that it would need to implement Stage I reductions during a single dry-year shortage event, and Stage II reductions during subsequent years of a multiple-dry-year shortage event. These are the same Contingency Plan implementation stages the City would need to implement without the SUMC Project in place.

The City, therefore, would have sufficient water available to serve the SUMC Project in addition to its existing and planned customers through its current water management planning horizon of 2030 in average year, dry-year, and multiple-dry-year conditions.
The City is projected to have adequate water supply to serve demands in the City through 2025, assuming WSIP and EWSS projects are completed as proposed in their respective EIR documents. Therefore, the City would not need new or expanded entitlements for water supplies and the cumulative impact would be less than significant.

**UT-7. Cumulative Wastewater Impacts.** Since the RWQCP has sufficient capacity to accommodate wastewater generated by cumulative development up to 2025, implementation of major facility and infrastructure improvements would not be necessary. In addition, general replacement and maintenance of old wastewater facilities is expected and would comply with applicable environmental regulations. Therefore, cumulative development would not have a significant cumulative impact related to wastewater. (LTS)

CPAU published an Urban Water Management Plan (UWMP) in December 2005, which projected that in 2025, the RWQCP would collect and treat approximately 30 mgd ADWF of wastewater, or 77 percent of its ADWF capacity of 39 mgd. This indicates that in 2025, the RWQCP would have sufficient capacity to accommodate cumulative development within its service area. Adding the wastewater from the SUMC Project, the RWQCP would receive 30.3 mgd, which is well below its 39 mgd capacity.

As discussed above, the RWQCP is projected to have adequate capacity to process the wastewater generated from the City through 2025. Therefore, the RWQCP would not exceed its NPDES permitted outflow of 39 mgd of wastewater and would not exceed the wastewater treatment requirements of the RWQCB.

Future development in the City of Palo could generate an increased amount of wastewater, and this increase could require the maintenance and replacement of outdated and deteriorated wastewater facilities. Any such replacements or maintenance would comply with all applicable environmental regulations. The City has a Capital Improvement Program that provides replacements and maintenance for the City’s utility facilities. This program is funded by the rates charged to customers for utility services. Ongoing maintenance of wastewater facilities would ensure that any potential for cumulative impacts would be less than significant.

**UT-8. Cumulative Stormwater Generation.** Cumulative development in the City of Palo Alto and at Stanford University could increase the amount of stormwater runoff. This increased level of runoff may trigger the need for the replacement or maintenance of storm drain facilities. However, general replacement and maintenance of storm drain facilities is included in City plans and would comply with applicable environmental regulations. Therefore, cumulative development would have a less-than-significant cumulative impact related to the capacity or deterioration of storm drain facilities. (LTS)

Stormwater impacts from development are usually limited to the drainage basin surrounding the SUMC Sites. Continued growth and development within the San Francisquito Creek Watershed could increase the amount of impervious areas. However, as discussed in Section 3.11, Hydrology, most of the foreseeable projects within the cities of Menlo Park and...
Palo Alto are primarily infill and re-development and would not substantially alter the amount of impervious surfaces within the watershed. As discussed under Impact HW-12, in Section 3.11, Hydrology, if the amount of impervious surfaces is increased, stormwater runoff controls would be required to ensure that runoff does not exceed existing rates for less than two-year through 10-year storm event for areas subject to Hydrologic Master Plan (HMP) controls. Other areas are already mostly impervious surfaces and redevelopment would not substantially alter the amount of impervious surface cover and hence, stormwater runoff. Furthermore, increased impervious surfaces in urban areas often have little effect on flows during extreme events (e.g., 100-year flood flow events) because during these events, rainfall saturates even natural soils, rendering them effectively impervious. Therefore, cumulative development would have a less-than-significant cumulative impact related to the capacity of storm drain facilities.

As the storm drainage system ages, the City may need to perform maintenance on deteriorated or outdated storm drain facilities. Future development in the City of Palo Alto could generate a limited increase in the amount of impervious surface, which could contribute to the deterioration of facilities. Any such maintenance would comply with all applicable environmental regulations. The City has a Capital Improvement Program to maintain the City’s utility facilities, which is funded by the rates charged to customers for utility services. Thus, ongoing maintenance of storm drain facilities would ensure that cumulative development in the City would not have a significant cumulative impact related to storm drain facilities.

**UT-9. Cumulative Solid Waste Impacts.** Cumulative development would generate solid waste within the permitted capacity of the SMART Station and Kirby Canyon Landfill. Cumulative development would not result in substantial deterioration of solid waste facilities. As such, cumulative impacts related to solid waste generation would be less than significant. (LTS)

**Construction of New or Expanded Solid Waste Facilities due to Insufficient Capacity.** The SMART Station serves the cities of Mountain View, Sunnyvale, and Palo Alto. From 2006 to 2007, the SMART Station processed an average daily tonnage of 1,188 tons, or at about 79 percent of its 1,500-ton permitted daily capacity. In 2006, the City of Palo Alto generated 195,273 tons (or 535 tons per day) of solid waste. In 2006, the City of Palo Alto diverted 48,413 tons (or 133 tons per day) of its solid waste to the SMART Station; approximately 25 percent of its total solid waste generated in 2006. The City uses a one percent annual growth rate to project future waste generation. At this rate, the City of Palo Alto is projected to

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85 Debbi Sargent, Project Administer of the SMART Station, electronic communication with PBS&J, March 10, 2008.
86 Russell Reiserer, Solid Waste Manager, City of Palo Alto Solid Waste Manager, electronic communication with PBS&J, March 12, 2008.
88 The City uses a one percent growth rate, from year to year, to determine future waste generation volume, based on the State Department of Finance’s population growth rate assumption of one percent per year for the City of Palo Alto.
generate 235,911 tons (or 646 tons per day) of solid waste in 2025. At its current rate, the City of Palo Alto would divert approximately 162 tons of solid waste per day to the SMART Station in 2025, an increase of approximately 29 tons of solid waste per day when compared to what was diverted in 2006.

In 2006, the City of Mountain View generated 212,857 tons (or 583 tons per day) of solid waste. In 2006, the City of Mountain View diverted 84,550 tons (or 232 tons per day) of its solid waste to the SMART Station; approximately 40 percent of its total solid waste generated in 2006. Mountain View does not have solid waste projections through 2025. Assuming the same solid waste generation growth rate as Palo Alto, the City of Mountain View is projected to generate 257,154 tons (or 705 tons per day) of solid waste in 2025. At its current rate, the City of Mountain View would divert approximately 282 tons of solid waste per day to the SMART Station in 2025, an increase of approximately 50 tons of solid waste per day when compared to what was diverted in 2006.

In 2006, the City of Sunnyvale generated 261,452 tons (or 716 tons per day) of solid waste. In 2006, the City of Sunnyvale diverted 130,633 tons (or 358 tons per day) of its solid waste to the SMART Station; approximately 50 percent of its total solid waste generated in 2006. Sunnyvale does not have solid waste projections through 2025. Assuming the same solid waste generation growth rate as Palo Alto, the City of Sunnyvale is projected to generate 315,863 tons (or 865 tons per day) of solid waste in 2025. At its current rate, the City of Sunnyvale would divert approximately 433 tons of solid waste per day to the SMART Station in 2025, an increase of approximately 75 tons of solid waste per day when compared to what was diverted in 2006.

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89 Using the compounding formula of \( P(1 + r)^t \), where \( P = 195,273 \) tons of solid waste generated by the City in 2006; \( r = 0.01 \); and \( t \) = time, in 2025 there would be \( 195,273(1 + 0.01)^9 = 235,911 \) tons of solid waste generated.
92 Lori Topley, Solid Waste Program Manager, City of Mountain View, telephone communications, March 30, 2010.
93 As the City of Mountain View does not have current or accurate solid waste projections through 2025, the City of Palo Alto’s methodology for projecting future solid waste generation has been applied to the City of Mountain View. Please note that the baseline (P) for solid waste generation in the City of Mountain View has been derived from the California Integrated Waste Management Board.
96 Mark Bowers, Solid Waste Program Manager, City of Sunnyvale, telephone communication, March 29, 2010.
97 As the City of Sunnyvale does not have current or accurate solid waste projections through 2025, the City of Palo Alto’s methodology for projecting future solid waste generation has been applied to the City of Sunnyvale. Please note that the baseline (P) for solid waste generation in the City of Sunnyvale has been derived from the California Integrated Waste Management Board.
In 2025, the cities of Mountain View, Sunnyvale, and Palo Alto would divert, on average, an additional 154 tons of solid waste per day to the SMART Station when compared to the average daily tonnage of received at the SMART Station from 2006 to 2007 (1,188 tons of solid waste per day). This would bring the average daily tonnage received at the SMART Station in 2025 to 1,342 tons of solid waste per day, or approximately 89 percent of its 1,500-ton permitted daily capacity. Cumulative development through 2025 within the SMART Station service area would not necessitate construction or expansion of solid waste transfer facilities, and cumulative impacts would be less than significant.

As discussed under Existing Conditions, the lease on the land for Kirby Canyon Landfill expires in 2034.88 The Kirby Canyon Landfill currently contains 6.5 million cubic yards of solid waste. The Landfill is therefore operating at less than 25 percent capacity and has approximately 21 million cubic yards of remaining capacity.99 In tonnage, there is approximately 21.6 million tons of remaining solid waste disposal capacity at the Kirby Canyon Landfill, of a total projected capacity of approximately 29 million tons.100 Annualized solid waste tonnage received by Kirby Canyon Landfill is approximately 475,000 tons.101 At that rate, the Kirby Canyon Landfill would reach capacity in approximately 45.5 years, well beyond the 2025 cumulative horizon for the SUMC Project. Additionally, various jurisdictions in the Bay Area are implementing policies to reduce solid waste. For example, Palo Alto has adopted “Zero Waste” goals, which strive to divert 73 percent of waste from landfills by 2011 and produce as little land filled solid waste as possible by 2025. Goals such as these would decrease the amount of solid waste flow into Kirby Canyon Landfill, compared to current rates. As such, cumulative development through 2025 within the Kirby Canyon Landfill service area would not necessitate construction or expansion of solid waste facilities, and cumulative impacts would be less than significant.

**Deterioration of Solid Waste Facilities.** The local enforcement agency (LEA), designated by the City of San Jose Code Enforcement, regulates Kirby Canyon Landfill and is responsible to inspect and enforce:

- State minimum standards for disposal sites, transfer stations, compost operations and facilities, construction and demolition operations and facilities, and other operations and facilities outlined in 14 California Code of Regulations (CCR), Chapters 3 and 3.1, applicable sections of 27 CCR Chapter 3;
- Solid waste facility permit terms and conditions; and
- The administration of Solid Waste Facilities Permits and Closure/Postclosure Maintenance Plans.

88 Kirby Canyon Landfill’s lease consists of an initial 10-year term ending in 2014 and two 10-year extensions ending in 2034.
101 Totals represent data from 2005 to 2006.
Therefore, the Kirby Canyon Landfill would be properly inspected and monitored preventing the substantial physical deterioration of its facilities.

Regarding potential deterioration of the SMART Station, the City of Sunnyvale contracts a maintenance company that would prevent deterioration of this facility throughout its operation. If operation of this facility would continue to 2025 and beyond, maintenance service is expected to continue and impacts would be less than significant.

**UT-10. Cumulative Energy Demand.** Cumulative development in the City of Palo Alto would consume additional energy and, therefore, would increase the demand for energy. The City’s electrical and natural gas facilities are projected to have adequate capacity to serve the City’s increased demand for energy. The increased level of energy demand may trigger the need for the replacement or maintenance of energy facilities. However, general replacement and maintenance of energy facilities is expected and would comply with applicable environmental regulations. Therefore, cumulative development would not have a significant cumulative impact related to energy demand and energy facilities. (LTS)

Energy consumption of most individual projects within the City would be subject to the California Energy Code (Title 24, Part 6), as described earlier under Applicable Plans and Regulations.” Compliance with Title 24, Part 6, would reduce the amount of energy consumed by future development and would help prevent any wasteful use of energy. As discussed under Existing Conditions, the peak electrical load for the City is projected to be 190 MW in 2017 and is expected to stay relatively constant after 2017; the City would still have approximately 195 MW remaining of its peak capacity of 385 MW. Therefore, cumulative development within the City would not require new facilities, which could result in an environmental impact.

As discussed under Existing Conditions, the CPAU projects that the annual gas demand for the City will be approximately 32.6 million therms by 2016; CPAU also projects that the demand would remain relatively constant in the long term after 2016. According to the CPAU, site specific loads could require upsizing of distribution components; however, overall deliverability of the City’s natural gas distribution system would have capacity for cumulative development in 2025, based on growth currently anticipated.

As discussed above, future development in the City of Palo Alto would increase energy demand, and this increase could require the maintenance and replacement of deteriorated energy facilities. Any such replacements or maintenance would comply with all applicable environmental regulations. The City has a Capital Improvement Program that provides replacements and maintenance for the City’s utility facilities. This program is funded by the rates charged to customers for utility services. Ongoing maintenance of energy facilities would ensure that any potential for cumulative impacts would be less than significant.