20863 STEVENS CREEK BOULEVARD, SUITE 100
CUPERTINO, CALIFORNIA 95014-2154
PHONE (408) 253-7071 • Fax (408) 253-5173

April 23, 2018

Mr. Chad Mosley, P.E.
City Engineer
Public Works Department
City of Cupertino
10300 Torres Avenue
Cupertino, CA 95014

RE: Vallco Development Alternatives

Dear Chad:

We have reviewed the information you provided for potential redevelopment of the Vallco Shopping Mall. The information you provided included four alternatives, one of which is getting new tenants to occupy the mall. The details of the alternatives are provided in Table 1.

Table 1 – Vallco Project Alternatives

EIR Project Alternatives	Commercial (SF)		Office (SF)		Hotel (rooms)		Residential		Hyatt House	Civic Space
	Existing	Buildout	Existing	Buildout	Existing	Buildout	Existing	Build out		Buildout
1.Occupied/ Re-tenanted Mall **(No Project Alternative)**	1,207,774	1,207,774	0	0	148	148	0	0	Hotel	0
2. General Plan Buildout with Residential Allocation **(Proposed Project)**		600,000		2,000,000		339		800		65,000 (10,000 SF for Stem Lab)
3. General Plan Buildout w/ Maximum Residential Alternative		600,000		1,000,000		339		2,640		65,000 (10,000 SF for Stem Lab)
4.Retail and Residential Alternative		600,000		0		339		4,000		0

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The Vallco shopping mall facility is connected via its laterals to 12", 15" and 27" sewer mains running north on Wolfe Road to Homestead road and subsequently to CuSD's Flume station, where CuSD's flow enters the City of Santa Clara system to the San Jose-Santa Clara Regional Wastewater Facility for treatment.

We have estimated the average daily sewage generation rates for each of the alternatives at the Vallco site, using CuSD's standard generation rates and applying them to the use types provided. The increase in average daily flow from the three development alternatives, as compared to the design flow for the current mall, ranges from 0.72 MGD to 1.04 MGD. The design average daily flow summary is provided in Table 2.

Table 2. Average Daily Flow Summary

Alternative	Average Daily Flow (MGD)	Flow greater than Alternative 1 (MGD)
1	0.28	-
2	1.00	0.72
3	1.21	0.94
4	1.32	1.04

Based on our analysis, the impact of additional flows from the Vallco alternatives will have a substantial impact on CuSD's collection system. The following collection system characteristics were considered in our evaluation:

1. District Collection System-Capacity in 12", 15", and 27" sewer mains
2. Permitted peak flow through Santa Clara system (13.8 MGD)
3. CuSD allocated capacity at the San Jose-Santa Clara Regional Wastewater Facility (7.85 MGD)

1. District Collection System-Capacity in 12", 15", and 27" Sewers

The 12" and 15" sewers that currently serve Vallco and downstream connections are already near their design capacities without further development at the Vallco site. The depth of flow divided by pipe diameter (d/D) modeling results for peak dry weather flow (PDWF) and peak wet weather flow (PWWF) are provided in Table 3. The d/D values are given as a range because they vary throughout the length of the pipe segment.

DISTRICT MANAGER-ENGINEER
MARK THOMAS & COMPANY, INC.
RICHARD K. TANAKA

DISTRICT COUNSEL
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MARC HYNES

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Table 3-Comparison of existing 12" and 15" sewer main to future conditions

	PDWF d/D		PWWF d/D	
	12" Segment	15" Segment	12" Segment	15" Segment
Alternative 1	0.65	0.58-0.9	0.8	0.65-1.4
Alternative 2	5-6	1-4	6-10	1-8
Alternative 3	9-10	1-7	9-10	6-7
Alternative 4	6-10	2-6	8-11	6-8

Other than Alternative 1, development alternatives 2, 3, and 4 will require upsizing both the 12" and 15" sewers. Either a parallel pipe, ranging in sizes from 18" to 21" or a new pipe would need to be installed to upsize the existing 12" and 15" sewers.

The flow modeling results for the 27" sewer under buildout conditions are provided in Table 4. The modeling results indicate that the 27" sewer would be operating beyond design capacity (d/D=2/3) during peak dry-weather and peak wet-weather conditions. The impact of this has not yet been determined, i.e. the impact to the Apple Campus and the potential for SSOs.

Table 4. 27" Sanitary Sewer Main under Buildout with Vallco's Alternatives

	ADWF	PDWF		PWWF	
	(MGD)	mgd	d/D	mgd	d/D
Alt. 2	5.370	9.95	0.54-0.69	14.04	0.68-0.88
Alt. 3	5.597	10.6	0.56-0.69	14.06	0.74-0.9
Alt. 4	5.71	10.95	0.61-0.73	14.51	0.73-0.91

2. Permitted peak flow through Santa Clara system (13.8 MGD)

The modeling results provided in Table 4 above indicate that CuSD would exceed the peak flow of 13.8 MGD through the City of Santa Clara. If the City of Santa Clara requires the District to upsize the Santa Clara's system to accommodate these flows, the District would expect the developer to provide these improvements within the City of Santa Clara. The District would consider an Installers' Agreement with future reimbursements.

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3. CuSD allocated capacity at the San Jose-Santa Clara Regional Wastewater Facility (7.85 MGD)

The CuSD allocation at the San Jose-Santa Clara Regional Wastewater Facility is based on average daily flow capacity of 7.85 MGD. Vallco developments will be within the allocated capacity for the treatment of the wastewater.

Project proposed under SB 35 would have similar impacts as above.

Prior to commencement of final design, Developer will be required to enter into an Installers' Agreement with the District, covering the installation of the parallel pipes, requirements of the downstream pipe capacity through City of Santa Clara and paying change in use fee, plan check engineering, inspection, and administration. in accordance with Operations Code, Chapter VII, "Permits, Fees and Service Charges". Our Operations Code are posted on our District Website.

If you have any questions, please feel free to contact Benjamin Porter or myself at (408) 253-7071.

Sincerely,

Richard K. Tanka, P.E.
District Manager/Engineer

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

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MEMORANDUM

TO: Kristy Weis (David J. Powers & Associates) DATE: May 18, 2018

FROM: Leif Coponen, PE (C70139) JOB#: DPOW 101.18.001
Melissa Reardon

SUBJECT: Vallco Area Specific Plan Recycled Water Study (DRAFT)

Schaaf & Wheeler has been retained by David J. Powers & Associates to prepare a feasibility report for the extension of recycled water to the Vallco Area Specific Plan (Project) area. The Project proposes the redevelopment of approximately 70 acres within the City of Cupertino with a combination of commercial, office, hotel, and residential land uses.

The proposed project consists of 600,000 square feet (sf) of commercial, 2,000,000 sf of office, 339 hotel rooms, and 800 residential dwelling units. The Specific Plan could also include a 30-acre green roof and 65,000 square feet of civic space. The City of Cupertino has also identified three alternatives to the proposed project: General Plan Buildout with Maximum Residential, Retail and Residential, and Occupied/Re-tenanted Mall. A summary of the development proposed under the project and project alternatives is provided in the table below.

Table 1. Summary of Project and Project Alternative development

	Land Uses					
	Commercial (sf)	Office (sf)	Hotel (rooms)	Residential (dwelling units)	Green Roof (ac)	Civic Space (sf)
Proposed Specific Plan	600,000	2,000,000	339	800	30	65,000 (10,000 of which would be for STEM lab use)
Project Alternatives						
General Plan Buildout with Maximum Residential Alternative	600,000	1,000,000	339	2,640	30	65,000 (10,000 of which would be for STEM lab use)
Retail and Residential Alternative	600,000	0	339	4,000	0	0
Occupied/Re-tenanted Mall Alternative	1,207,774	0	148	0	0	0

All alternatives include irrigated landscape. The extension of the recycled water infrastructure is proposed for landscaping irrigation purposes for the proposed project, General Plan Buildout with Maximum Residential Alternative, and Retail and Residential Alternative.

The Occupied/Re-tenanted Mall Alternative would not result in redevelopment of the site. The existing landscaping and irrigation would remain as it is currently under the Occupied/Re-tenanted Mall Alternative. Use of recycled water or the extension of the recycled water infrastructure is not proposed as part of the Occupied/Re-tenanted Mall Alternative. For these reasons, the Occupied/Re-tenanted Mall Alternative is not evaluated in this memo.

This study focuses on the proposed project, General Plan Buildout with Maximum Residential Alternative, and Retail and Residential Alternative and assumes the irrigated landscape area is the same for all three of the alternatives under consideration.

Project Recycled Water Demand

Two recycled water demand scenarios are evaluated for this study: landscape irrigation (Baseline) and landscape irrigation with green roof (Green Roof).

Baseline Demand Scenario: Landscape Irrigation Only

Recycled water demand in this scenario includes landscape irrigation demand only. Based on information provided by the City, there will be between 2.8 and 5.6 acres of irrigated landscape. An irrigation demand of 2 acre-feet per year (AFY) per acre is assumed for the irrigated landscape, which is consistent with the Water Supply Assessment being prepared for the Project. Thus, the recycled water demand for the Baseline demand scenario is between 4,999 and 9,999 gallons per day (gpd) of Average Day Demand (ADD).

A peaking factor of 6.40 from the *City of Sunnyvale Feasibility Study for Recycled Water Expansion Report* (Hydroscience, 2013) was applied to the Baseline ADD to determine Baseline Peak Hour Demand (PHD). The Baseline PHD is between approximately 32,000 and 64,000 gpd. A summary of ADD and PHD for the Baseline demand scenario is provided in Table 2.

Table 2. Baseline ADD and PHD

	Demand (AFY)	Demand (gpd)	Demand (gpm)
Average Day Demand	6 – 11	4,999 – 9,999	4 – 7
Peak Hour Demand	36 – 72	31,994 – 63,994	22 – 45

Green Roof Demand Scenario: Landscape Irrigation with Green Roof

Recycled water demand in the Green Roof demand scenario includes landscape irrigation demand, as described above, in addition to irrigation demand for a 30-acre green roof. The recycled water demand for the irrigated landscape is between 4,999 and 9,999 gpd of ADD. The green roof is assumed to have a demand of 90 AFY, or 80,436 gpd. The total recycled water demand for the Green Roof demand scenario is between approximately 85,000 and 90,000 gpd of ADD.

A peaking factor of 6.40 from the *City of Sunnyvale Feasibility Study for Recycled Water Expansion Report* (Hydroscience, 2013) was applied to the Green Roof ADD to determine Green Roof PHD. The

Green Roof PHD is between approximately 547,000 and 579,000 gpd. A summary of ADD and PHD for the Green Roof demand scenario is provided in Table 3.

Table 3. Green Roof ADD and PHD

	Demand (AFY)	Demand (gpd)	Demand (gpm)
Average Day Demand	96 – 101	85,367 – 90,365	59 – 63
Peak Hour Demand	612 – 648	546,784 – 578,784	371 – 402

Recycled Water System Supply

Recycled water for the existing distribution system is supplied by the City of Sunnyvale's Water Pollution Control Plant (WPCP). Currently, the WPCP treats wastewater to recycled water standards (Title 22, Chapter 3 of the California Code of Regulations: Water Recycling Criteria) in batches, rather than continuously, due to plant configuration limitations. As a result, potable water has historically been blended with recycled water to meet peak demands in the recycled water system.

In 2014, the City of Sunnyvale received grant funding to make improvements to the WPCP to provide recycled water continuously. These improvements are expected to be complete in Summer of 2019. According to the grant application (Association of Bay Area Governments, 2014), the WPCP improvements will allow for the production of, at a minimum, 1,680 AFY to meet 1,120 AFY of existing demand within Sunnyvale and 560 AFY of demand along the Wolfe Road Pipeline in Sunnyvale and Cupertino.

The 560 AFY of demand for the Wolfe Road Pipeline includes demands for the Apple Campus 2, 11 sites along the pipeline, and eight sites extending from the pipeline previously identified in the *City of Sunnyvale Feasibility Study for Recycled Water Expansion Report* (Hydroscience, 2013). The demand for these projects, however, is estimated as 495 AFY in the Hydroscience (2013) report. Based on the Baseline maximum ADD of 11 AFY, there should be adequate supply available for the Project from the WPCP with the upgrades to be completed in Summer of 2019 under the Baseline demand scenario.

Currently, demand for recycled water consists of the existing Sunnyvale demand and the Apple Campus 2 demand. The Apple Campus 2 is estimated to have a demand of 235 AFY in the Hydroscience (2013) report. Based on the minimum planned capacity of the WPCP with improvements of 1,680 AFY and current demand of 1,355 AFY, there should be adequate supply for the Project with the Green Roof maximum ADD of 101 AFY. However, as stated above, there are about 20 sites that were previously identified in the Hydroscience (2013) report as potential recycled water customers from the Wolfe Road Pipeline. If these projects connect to the recycled water system before the Project with the demands estimated in the Hydroscience (2013) report, there may not be sufficient supply from the WPCP for the Project with the Green Roof demand. As the Project moves forward, any potential service constraints will have to be discussed with the City of Sunnyvale as the recycled water supplier and the Santa Clara Valley Water District (SCVWD) as the wholesaler.

Recycled Water Distribution System

The existing recycled water distribution system delivers recycled water from the City of Sunnyvale WPCP to customers in Sunnyvale and to the Apple Campus 2 in Cupertino via the recently constructed Wolfe

Road Pipeline. Recycled water is pumped from the WPCP to the San Lucar site, which has an existing 2.0 MG tank and pump station that serves Sunnyvale customers primarily located in northern Sunnyvale.

The recently constructed Wolfe Road Pipeline Project extends the recycled water system from the existing San Lucar site south to the intersection of Wolfe and Homestead Roads in the City of Cupertino. The pipeline project also included the construction of a booster pump station at the San Lucar site, which has a current maximum capacity of 250 gallons per minute (gpm) but can be expanded in the future to a maximum of 7,000 gpm based on drawings from the SCVWD. The SCVWD owns the Wolfe Road Pipeline and booster pump station and is the wholesaler of recycled water from the pipeline.

In the future, the SCVWD plans to expand the recycled water system within the District through a number of possible projects. The Wolfe Road Pipeline, for example, has the potential to deliver 10,100 AFY of advanced purified water to SCVWD groundwater injection wells. The SCVWD may also extend the recycled water piping system south and east of the Project area from the terminus of the Wolfe Road Pipeline (Figure 1).

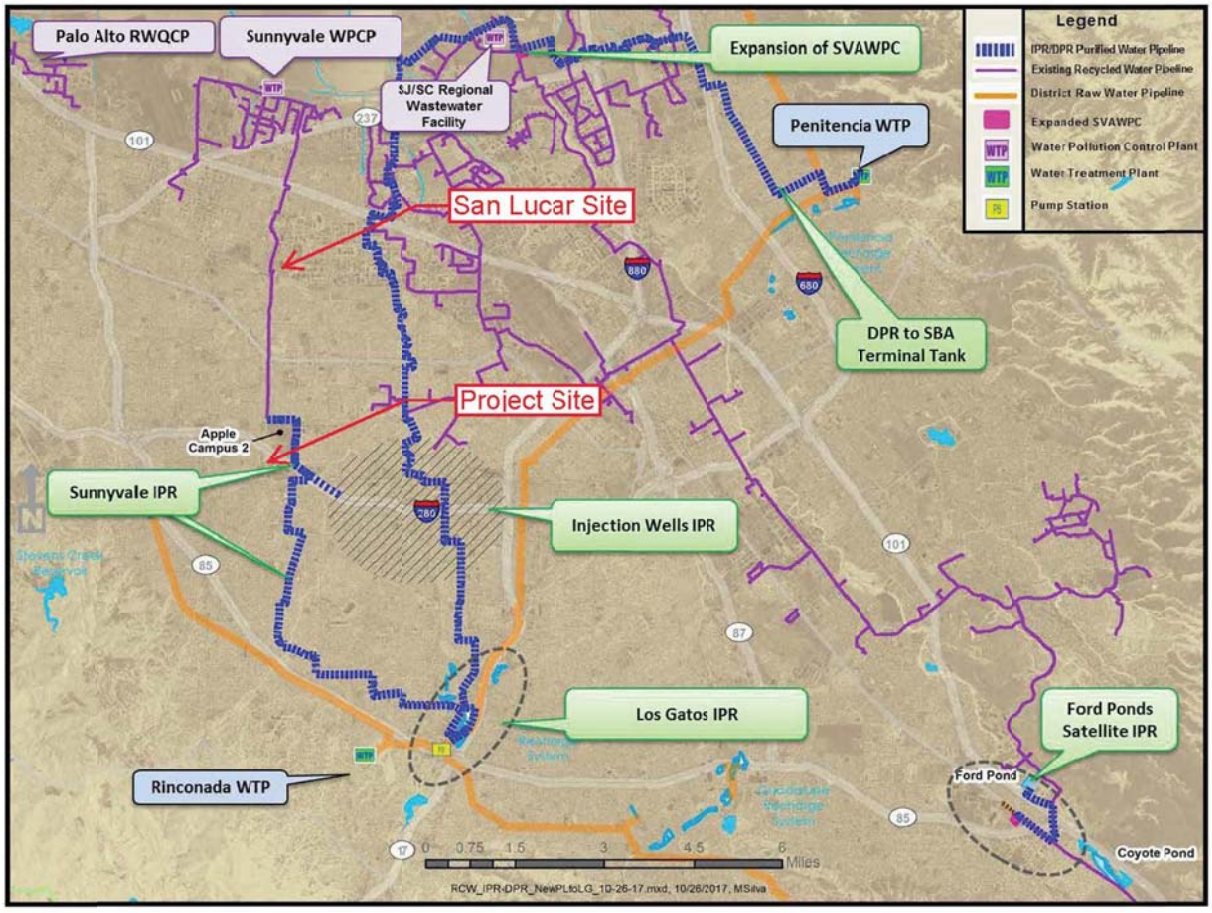

Figure 1. SCVWD Recycled Water System Expansion

Source: SCVWD P-3 Purified Water Program, 2017

Based on discussions with the SCVWD, there may be adequate capacity with the existing booster pumps at the Wolfe Road Pipeline booster pump station to serve the Project under the Baseline demand scenario. The current booster pumps are designed to only serve the Apple Campus 2 demand, which is estimated as 235 AFY in the *City of Sunnyvale Feasibility Study for Recycled Water Expansion Report* (Hydroscience, 2013). Further analysis is required to determine the 24-hour demand cycles at the Project and to compare these to existing demand cycles, especially for summer time use. If adequate capacity is not available at the Project with the existing pumps, one additional pump would need to be added at the Wolfe Road Pipeline booster pump station.

Under the Green Roof demand scenario, there likely will not be adequate capacity with the existing booster pumps. Because the Green Roof maximum ADD is approximately half of the Apple Campus 2 demand, one or more additional pumps would need to be added to the Wolfe Road booster pump station.

Potential Project Connections

There are two potential connections to the recycled water system for the Project considered in this study, as shown in Figure 2. For both connections, the SCVWD is the recycled water wholesaler and California Water Service Company (Cal Water) is the recycled water retailer within the Project area. In Connection Option 1, a new pipe would be constructed from the terminus of the Wolfe Road Pipeline south along Wolfe Road to the Project area. In Connection Option 2, the Project would connect to the future SCVWD recycled water pipeline at Tantau Avenue and Stevens Creek Boulevard with a pipe extending west along Stevens Creek Boulevard to the Project area.

It is assumed that a pipeline would be extended from the recycled water mains to the Project area in this study. However, the SCVWD has expressed that it may instead want the Project to build a new 24-inch recycled water main along Wolfe Road to the Project area with a turnout for the Project at the terminus of the new main. This would allow the SCVWD recycled water system to extend further south and reach other potential customers. While this option is not analyzed in this study, constructing this new 24-inch main would require certain agreements with the SCVWD, as discussed at the end of this study.

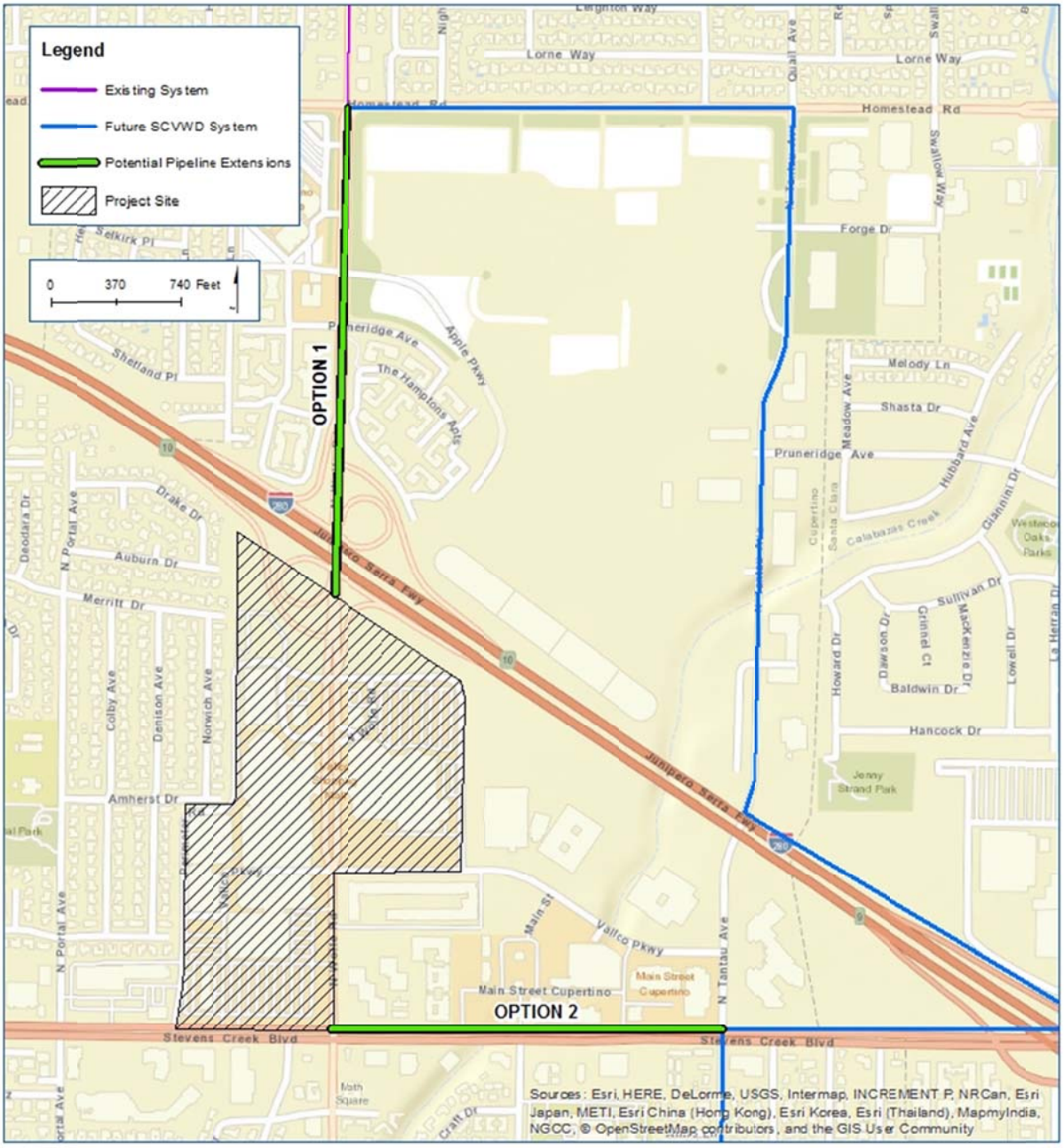

Figure 2. Potential Connections to the Project

Recycled Water Pipe Sizing and Hydraulics

In sizing the connection between the Project and the recycled water system, flow in the pipe is conservatively assumed to be the maximum PHD for each demand scenario. Velocity is constrained to 5 feet per second for both demand scenarios to determine a minimum pipe diameter. However, the ultimate goal of the hydraulic analysis is to minimize the head loss in the pipe within reason. Head loss is calculated using the Hazen Williams equation with a roughness value of 130. Both connection options are considered for each demand scenario. In total, four demand scenario-connection option combinations are analyzed.

Baseline Demand Scenario

With a velocity constraint of 5 feet per second in the pipe and the Baseline maximum PHD of 45 gpm, the pipe could have a 2- to 4-inch diameter. A four-inch diameter pipe would allow for higher demands in the future should Project demands increase; the two-inch diameter pipe would limit demand to the 45 gpm estimated in this study given the velocity constraint of 5 feet per second.

Currently the booster pump station for the Wolfe Road Pipeline maintains a pressure of 55 psi at the terminus of the pipeline, based on discussions with the SCVWD. The anticipated static pressure at the Project is approximately 46 psi based on the difference in elevation between the terminus of the Wolfe Road Pipeline and the Project Area. Assumptions made in the head loss calculations for both connection options are given in Table 4.

Connection Option 1: Wolfe Road Connection

For Connection Option 1, approximately 3,000 feet of new pipe would be extended from the intersection of Wolfe and Homestead Roads to the northern edge of the Project along Wolfe Road. Head loss in the pipe is anticipated to be 2.3 pounds per square inch (psi). The anticipated pressure at the Project area with Baseline demand is therefore approximately 43.7 psi.

Connection Option 2: Tantau Avenue Connection

In this connection option, approximately 2,300 feet of new pipe would be laid from the intersection of Tantau Avenue and Stevens Creek Boulevard to the southern edge of the Project at the intersection of Wolfe Road and Stevens Creek Boulevard. Head loss in the pipe is anticipated to be 1.7 psi with the Baseline demand so pressure at the Project area is anticipated to be approximately 44.3 psi.

Table 4. Baseline Demand Scenario Hydraulics

	Connection Option 1	Connection Option 2
Pipe Diameter (in)	4	4
Pipe Length (ft)	3,000	2,300
Hazen Williams Roughness Value, C	130	130
Flow Rate (gpm)	45	45
Total Head Loss (psi)	2.3	1.7
Pressure at Project site (psi)	43.7	44.3

Green Roof Demand Scenario

With a velocity constraint of 5 feet per second in the pipe and the Green Roof maximum PHD of 402 gpm, the pipe could have a 6-inch diameter at a minimum. However, because head loss could be considerable, this analysis considers both 6-inch diameter pipe and 8-inch diameter pipe for each connection option.

As described previously, the anticipated static pressure at the Project site with the current booster pump station for the Wolfe Road Pipeline is 46 psi. It is conservatively assumed that the additional pump or pumps required for the Green Roof demand scenario do not result in higher static pressure. Assumptions made in the head loss calculations for both pipe diameters and both connection options are given in Table 5.

Connection Option 1: Wolfe Road Connection

For this connection option, approximately 3,000 feet of new pipe would be laid to connect to the Project area. Head loss in the pipe is anticipated to be 18.2 psi with 6-inch diameter pipe and 4.5 psi for 8-inch diameter pipe, respectively. Because the 8-inch diameter pipe results in a considerably lower head loss, the recommended pipe for this connection option is 8-inch diameter. The anticipated pressure at the Project area with Project demand is therefore approximately 41.5 psi with the recommended pipe.

Connection Option 2: Tantau Avenue Connection

Assuming 2,300 feet of new pipe is laid for this connection option, head loss is anticipated to 13.9 psi with the 6-inch diameter pipe and 3.4 psi with the 8-inch diameter, respectively. Because the 8-inch diameter pipe results in a considerably lower head loss, the recommended pipe for this connection option is 8-inch diameter. Pressure at the Project area with Green Roof demand is anticipated to be approximately 42.6 psi with the recommended pipe.

Table 5. Green Roof Demand Scenario Hydraulics

	Connection Option 1		Connection Option 2	
Pipe Diameter (in)	6	8	6	8
Pipe Length (ft)	3,000	3,000	2,300	2,300
Hazen Williams Roughness Value, C	130	130	130	130
Flow Rate (gpm)	403	403	403	403
Total Head Loss (psi)	18.2	4.5	13.9	3.4
Pressure at Project site (psi)	27.8	41.5	32.1	42.6

Additional Required Infrastructure

Irrigation systems can require pressures higher than what is anticipated for the Project. For example, spray irrigation systems typically operate at higher pressures. An on-site irrigation booster pump may be required for the irrigated landscape and green roof considered in this study.

Required Agreements and Additional Considerations

Further discussions may be required with the SCVWD, Cal Water, and other entities should the Project choose to go forward with recycled water use. Regardless of the demand scenario or connection option, a series of agreements between the City of Sunnyvale, SCVWD, Cal Water, and the Project would need to be made to provide a specified amount of recycled water to the Project. The SCVWD, as the wholesaler, would coordinate with the City of Sunnyvale, as the recycled water supplier, to execute new agreements or amend existing agreements, as appropriate, to secure recycled water for the Project. The SCVWD and the City of Sunnyvale would ultimately determine if there is sufficient supply for the Project. The SCVWD, as the wholesaler, then would execute new agreements or amend existing agreements, as appropriate, with Cal Water, as the water retailer, to provide water to the Project. Finally, the service agreement between Cal Water, as the retailer, and the Project, as the customer, would specify how much water will be available for purchase.

Additional agreements would need to be made with the SCVWD depending on the ultimate demand scenario and connection option for the Project. If one or more additional pumps are required to provide recycled water to the Project, the Project would need to discuss cost-sharing for the addition of the new pump or pumps with the SCVWD, as the SCVWD owns, maintains, and operates the Wolfe Road Pipeline and booster pump station. Further agreements would need to be made if the Project chose to build a

new 24-inch main down Wolfe Road as discussed earlier in this study. Based on conversations with the SCVWD, a funding agreement between the SCVWD and the Project would likely need to be prepared whereby the Project pays for the construction of the 24-inch recycled water main and the District accepts ownership of the pipeline and responsibility for operations and maintenance. There would also likely be a provision whereby the District provides the operations and maintenance itself or can contract with another entity to provide the operations maintenance.

The Project may also need to have discussions with Cal Water as the recycled water retailer for the Project area. In the agreement between the SCVWD and Cal Water for the Wolfe Road Pipeline and booster pump station, Cal Water was responsible for the construction and maintenance of service lines, turnouts, and meters as the recycled water retailer to the Apple Campus 2. Because Cal Water is also the recycled water retailer for the Project area, discussions with Cal Water may include pipeline construction cost-sharing as well as ownership, operations, and maintenance of the pipeline from the recycled water system to the Project. The Project would also need to secure a service agreement with Cal Water to purchased recycled water.

Additionally, encroachment permits from Caltrans will be required for construction of the pipeline to the Project area. For Connection Option 1 in particular, an encroachment permit from Caltrans would be required as the pipeline would cross Interstate 280 to reach the Project area from the intersection of Wolfe and Homestead Roads.

References

Association of Bay Area Governments. Proposition 84 Integrated Regional Water Management 2014 Drought Grant Application Attachment 3: Project Justification. September 2014.

Hydroscience. City of Sunnyvale Feasibility Study for Recycled Water Expansion Report. June 2013.

Santa Clara Valley Water District. Board Agenda Memo: Agreements with City of Sunnyvale, California Water Service Company, and Apple Inc., for Expansion of Recycled Water. September 2014.

Santa Clara Valley Water District. P-3 Purified Water Program. https://www.valleywater.org/contractors/doing-businesses-with-the-district/p3-purified-water-program.

VALLCO AREA SPECIFIC PLAN

SB610 WATER SUPPLY ASSESSMENT

CUPERTINO, CALIFORNIA

DRAFT

MAY 21, 2018

Prepared by:

Yarne & Associates, Inc.

For

California Water Service
Los Altos Suburban District

949 B Street
Los Altos, CA 94024

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Introduction and Project Description

California Water Service (Cal Water) has prepared this California SB 610 Water Supply Assessment (WSA) for the Vallco Area Specific Plan (hereafter referred to as "Vallco ASP"). The Los Altos Suburban (LAS) district of Cal Water provides potable water service to all customers within the proposed development area of the Vallco ASP.

The Vallco ASP covers approximately 70 acres of which 58 acres are developable. The developable area is located on both sided of North Wolf Road between Vallco Parkway and Interstate 280 on the east side and between Stevens Creek Blvd and Vallco Parkway on the west side of the City of Cupertino. Most of the project area is comprised of the existing Vallco Shopping Mall parking areas, roadways and a hotel under construction which is considered to be part of the ASP.

Attached are City of Cupertino Notice of Preparation Figure 2 (vicinity map) and Notice of Preparation Figure 3 (aerial photo of the existing site and surroundings).

The existing Vallco Shopping Center is a regional shopping mall of 1,199,699 square feet (ft^2) of retail, restaurant and recreational uses. The existing mall has experienced a significant decline in occupancy during the past several years resulting in a lower occupancy rate. Major anchor tenants including Sears and Macy's closed their stores in the mall. In May 2015, 796,527 ft^2 or 66.4% of available space was occupied and 403,172 ft^2 or 33.6% of space was vacant. For purposes of determining new water demand associated with the Vallco ASP, the occupancy rate for May 2015 is used to determine existing water use since that demand was part of the total Los Altos Suburban (LAS) District demand in the 2015 LAS District Urban Water Management Plan (UWMP).

Following are the facilities for the "**Proposed Project**" for the Vallco ASP as of April 23, 2018:

1. **Commercial - 600,000 sq ft** which includes:
   Retail – 420,000 sq ft
   Recreation Uses: Movie Theatre, Bowling Alley, Ice Rink – 180,000 sq ft

2. **Office - 2,000,000 sq ft**

3. **Hotel – 339 rooms**

4. **Residentia**l - **800 dwelling units**

5. **Civic Area – 65,000 sq ft including 10,000 sq ft for STEM Lab**

6. **Green Roof and Ground Landscaping – 36.06 acres total**
   comprised of 5.6 acres ground surface landscaping and 30.46 acres of green roof landscaping.
   The green roof would cover and cross over the tops of the buildings on-site and come to

the existing grade at the western boundary of the project site at Stevens Creek Boulevard. It would include landscaping and active and passive open spaces.

Following are the proposed facilities for the alternative described as "**General Plan Build-out with Maximum Residential Density**"

1. **Commercial - 600,000 sq ft** which includes:
   Retail – 420,000 sq ft
   Recreation Uses: Movie Theatre, Bowling Alley, Ice Rink – 180,000 sq ft

2. **Office - 1,000,000 sq ft**

3. **Hotel – 339 rooms**

4. **Residential – 2,640 dwelling units**

5. **Civic Area – 65,000 sq ft including 10,000 sq ft for STEM Lab**

6. **Green Roof and Ground Landscaping – 36.06 acres total** – same as Proposed Project

Following are the proposed facilities for the alternative described as "**Retail and Residential Alternative**"

1. **Commercial - 600,000 sq ft** which includes:
   Retail – 420,000 sq ft
   Recreation Uses: AMC Theatre, Bowling Alley, Ice Rink – 180,000 sq ft

2. **Office – 0 sq ft**

3. **Hotel – 339 rooms**

4. **Residential – 4,000 dwelling units**

5. **Ground Landscaping – 5.6 acres**

Following are the proposed facilities for the alternative described as "**Occupied/Re-Tenanted Mall**"

1. **Commercial – 1,207,774 sq ft** which includes:
   Retail – 1,189,774 sq ft
   Recreation Uses: AMC Theatre, Bowling Alley, Ice Rink – 180,000 sq ft

2. **Office – 0 sq ft**

3. **Hotel – 148 rooms**

4. **Residential – 0 dwelling units**

5. **Ground Landscaping – 5.6 acres**

Construction of the Vallco ASP is estimated to start in the first quarter of 2019. All facilities are estimated to be constructed and in use 10 years later or in the first part of 2029.

The Vallco ASP is not specifically covered in Cal Water's LAS District 2015 UWMP; therefore, its water supply requirements are addressed in this WSA.

The 2015 UWMP is based on data up to 2015 and is the most recent UWMP; however, water demand data for 2016 – 2017 were obtained and used in the WSA.

The 2015 LAS District UWMP can be referenced for more detailed information on historic and forecasted water demand and supply and other related topics.

Senate Bill 610 (Chapter 643, Statutes of 2001) (SB 610) amended state law as of January 1, 2002, to include consideration of water supply availability when cities and counties are making land use development decisions. SB 610 requires detailed information on water supply availability be provided to local public agency decision-makers prior to approval of development projects that meet or exceed any of the following criteria:

1. A residential development of more than 500 dwelling units.
2. A shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet.
3. A commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.
4. A hotel or motel with more than 500 rooms.
5. An industrial, manufacturing or processing plant or industrial park planned to house more than 1,000 persons occupying more than 40 acres of land or having more than 650,000 square feet of floor area.
6. A mixed-used project that includes one or more of the projects specified above.
7. A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

Because the proposed Vallco ASP exceeds criteria 1, 2, 3 and 6 above, a WSA is required. The WSA assesses the adequacy of the water supply to meet the estimated demands of the proposed Vallco ASP over the next 20 years and those of Cal Water's LAS District customers and projected new users under normal, single dry year and multiple dry year conditions. (Water Code §10911(a)). SB 610 requires that the information presented in a WSA be included in the administrative record that is the basis for an approval action by the local public agency.

SB 610 recognizes local control and decision-making regarding availability of water for projects and approval of projects. A WSA is to be provided to local governments for inclusion in environmental documentation for projects subject to the California Environmental Quality Act (as defined in Water

Code 10912 [a]).

Vallco Area Specific Plan Water Demand

Forecasting net new water demand for the Vallco ASP is generally based on multiplying the estimated water use on a gallons per day per square foot (gpd/ft^2) basis for non-residential use categories by the new square footage for each category and summing the total. For residential single family and multi-family categories, water demand is based on LAS District residential use data.

Cal Water has used historic water use data by user classes to develop estimates of water demand for various projected development uses. Due to implementation of more aggressive water conservation practices and requirements, historic unit water use factors are viewed as being higher than the water use factors projected for new developments in 2018 and beyond. Accordingly, the method used here was to:

1. Estimate water demand of existing uses
2. Estimate water demand of proposed new development based on newer water conservation requirements for toilets, showers, dishwashers, washing machines and outdoor landscaping and irrigation systems.
3. Determine the net increase in project water demand by subtracting existing demand from estimated new development demand.

Following are water use factors by user categories historically experienced by Cal Water:

Average Water Use Factors

Category	gpd/ft^2
Dry goods stores:	0.110
Commercial offices:	0.05
Restaurants (food service):	1.10
Supermarkets and food stores:	1.10
Recreational & Entertainment:	0.55

US Census Bureau data for 2010 obtained by Cal Water indicate that the number of multi-family dwelling units in the LAS District was 8,517. The total water demand for multi-family services in 2010 was 656 AFY. Therefore, the water use factor is 0.077 AFY/dwelling unit or 68.7 gpd/dwelling units.

Estimated Existing Average Daily Water Use in the Vallco Shopping Mall:

A breakdown of available space by user category for the existing shopping center is not available; therefore, the following assumptions are made:

Dry goods stores: 80% x 796,527 ft^2 = 637,222 ft^2
Restaurants and food stores: 15% x 796,527 ft^2 = 119,479 ft^2
Commercial offices: 5% x 796,527 ft^2 = 39,826 ft^2

Estimated Existing Building Water Use:

Dry goods stores: 637,222 ft^2 x 0.110 gpd/ft^2 = 70,094 gpd
Restaurants and food stores: 119,479 ft^2 x 1.10 gpd/ft^2 = 131,427 gpd
Commercial offices: 39,826 ft^2 x 0.05 gpd/ft^2 = 1,991 gpd
Total Estimated Existing Building Average Daily Water Use: 203,512 gpd

Estimated Existing Landscape Irrigation Water Use:

Metered data for only landscape irrigation in the LAS District is not available. In nearby Cal Water districts, irrigation usage for parks and landscaped areas ranges from 3.0 – 4.0 AFY per acre. For a park area in San Mateo, metered sales records for two existing parks for 34 months yielded an irrigation rate of 3,615 gallons per day/acre or 4.05 AFY per acre. For commercial office landscaping in South San Francisco for one year period, total landscape irrigation water use was 7,219,192 gallons for an area of 250,143 square feet. Therefore, average daily irrigation water use was: 0.079 gallons/day/ft^2 or 3.85 AFY per acre. Both of these irrigations rates were for non-drought periods and conventional irrigation methods. For the existing Vallco Shopping center site, a lower application rate of irrigation water is assumed due to the 5 years of drought (2012, 2013, 2014, 2015and 2016) or 3 AFY per acre or 2,676 gpd/acre. Based on an aerial photo, it is estimated that there are 4.7 acres of landscaped areas.
Therefore, estimated existing irrigation water use is 2,676 gpd/acre x 4.7 acres = 12,577 gpd.

Estimated Existing Total Shopping Center Area Water Use: 203,512 gpd + 12,577 gpd = 216,089 gpd

Estimated Water Use for the Proposed Project:

The Proposed Project will replace facilities with buildings that will fully comply with more stringent and current city water conservation requirements including the California Plumbing Code and the California Green Building Code, which mandate installation of water conserving plumbing fixtures and fittings.

Existing water use in the Vallco Shopping Center is based on higher historic water use rate data (gpd/ft^2). It is estimated that new Proposed Vallco ASP facilities will achieve a reduction in water use rates of 25%.

For example, old toilets often exceed 2 gallons per flush. Later toilets use 1.6 gallons per flush. The latest water efficient toilets use only 0.6 gallons per flush. Depending on the reference toilet, the latest toilets achieve 62.5% to 70% reduction in water use. In residential dwelling units, new dishwashers will be installed which use less water than older conventional machines, which use between 7 and 14 gallons per wash load. New water efficient dishwaters use between 4.5 and 7 gallons per wash load. Using an average of 10.5 gallons for conventional dishwashers and 5.75 gallons for new water efficient dishwashers results in an average savings of 4.75 gallons per load or a reduction of 45%. Showers with restricted flow heads have an average flow rate of 2.0 gallons per minute (gpm) versus conventional shower head flows of 2.5 gpm or a 20% reduction.

Washing machines 18 years or older used 40 gallons per standard load versus new machines using only13 gallons per load or a reduction of 67.5%.

1. Commercial Uses (600,000 ft^2):
   1) Retail (420,000 ft^2): Assume 80% of space is dry goods and 20% is restaurants and food stores
   Therefore the average water use rate is: 0.8 x 0.11 + 0.2 x 1.10 = 0.308 gpd/ft^2
   0.75 x 0.308 gpd/ft^2 x 420,000 ft^2 = 97,020 gpd
   2) Recreational & Entertainment (180,000 ft^2):
   0.75 x 0.55 gpd/ft^2 x 180,000 ft^2 = 74,250 gpd
   3) Total Commercial: 97,020 + 74,250 = 171,270 gpd

2. Residential (800 units):
   0.75 x 68.7 gpd/dwelling unit x 800 dwelling units = 41,220 gpd

3. Office (2,000,000 ft^2):
   0.75 x 0.05 gpd/ft^2 x 2,000,000 ft^2 = 75,000 gpd

4. Green Roof and Ground Landscaping (36.06 acres):
   Based on use of new irrigation systems using drip irrigation for plantings, soil moisture monitoring for controlling irrigation amounts (frequencies and durations) and planting of lower water using vegetation, an irrigation rate of 2.0 AFY/acre or 1,785 gpd/acre is used here. This results in an estimated demand of 1,785 gpd/acre x 36.06 acres = 64,367 gpd

5. Hotel (339 rooms):
   Water use for hotels with a restaurant is estimated to be 0.50 gallons/day/sq ft. Estimated total hotel space per room is estimated to be 390 sq ft.
   Therefore, estimated hotel water demand is: 339 rooms x 390 sq ft/room x 0.50 gallons/day/sq ft = 66,105 gpd

6. Civic Space (65,000 ft^2 including 10,000 ft^2 for a Science, Technology, Engineering and Mathematics (STEM) laboratory for high school students
   Civic space is viewed as the equivalent of office space; therefore, the civic space water use factor is estimated to be 0.75 x 0.05 gpd/ft^2 = 0.0375 gpd/ft^2. The STEM laboratory is assumed to have a higher water use rate of 0.75 x 0.55 gpd/ft^2 = 0.412 gpd/ft^2:
   55,000 ft^2 x 0.0375 gpd/ft^2 + 10,000 ft^2 x 0.412 gpd/ft^2 = 6,182 gpd

7. Total Proposed Project estimated average daily potable water use: 171,270 + 41,220 + 75,000 + 80,369 + 64,367 + 6,182 = 438,408 gpd

Estimated net increase in average daily potable water use for the Proposed Project is: 438,408 gpd – 216,089 gpd = 222,319 gpd or 249.0 AFY.

The City of Cupertino indicates that the green roof and landscape irrigation requirements estimated to be 64,367 gpd or 72.1 AFY may be met by use of recycled water. If 100% of irrigation water supply were recycled water, it would result in an estimated total potable water

use for the Proposed Project of 374,041 gpd. For this scenario, the Proposed Project would have an estimated increase in potable water use of 374,041 – 216,089 = 157,952 gpd or 176.9 AFY.

An agreement involving Cal Water, the City of Sunnyvale, Santa Clara Valley Water District (SCVWD), City of Cupertino and the Sand Hill Property Company will need to be prepared and negotiated. It will have to address roles and responsibilities, costs, financing, design and construction, recycled water delivery quantities and quality and a schedule for implementation of recycled water delivery. Since that process has not started and it could take several years for all of this to occur, the WSA assumes that at commencement of use of project facilities, all water needs will be met by potable supplies.

Agreements involving the City of Sunnyvale (source of the recycled water), SCVWD (responsible for the transmission system to the City of Cupertino) Cal Water (responsible for retail delivery of recycled water to the Apple Campus 2 site) and Apple (end user and contributor for paying part of the conveyance system capital costs) were negotiated and signed and the recycled water pipeline constructed. However, delivery of recycled water has not started. The City of Cupertino expressed support for design and construction of an extension of the recycled water transmission line from the Apple Campus to the Hamptons housing project and the Vallco area.

Cal Water supports the use of recycled water for the Hamptons and Vallco projects, but is not engaged in developing an agreement for that purpose.

Estimated Water Use for the General Plan Build-out with Maximum Residential Density Alternative

Commercial – same as Proposed Project or 171,270 gpd

Office – one half of the Proposed Project (1,000,000 sq ft) or 37,500 gpd

Hotel – same as Proposed Project or 66,105 gpd

Residential – 2,640 dwelling units or 3.3 x 41,220 gpd (Proposed Project) or 136,026 gpd

Green Roof and Ground Landscaping – same as Proposed Project or 64,367 gpd

Civic Space and STEM laboratory – same as Proposed Project or 6,182 gpd

Total Plan Build-out with Maximum Residential Density Alternative estimated average daily potable water use: 171,270 + 37,500 + 66,105 + 136,026 + 64,367 + 6,182 = 481,450 gpd

Estimated net increase in average daily potable water use for the Plan Build-out with Maximum Residential Density is:
481,450 gpd – 216,089 gpd = 265,361 gpd or 297.2 AFY.

If the landscaped areas are irrigated with recycled water, then the estimated potable demand for

this alternative decreases to 417,083 gpd and the net increase in demand is 200,994 gpd or 225.2 AFY.

Estimated Water Use for the Retail and Residential Alternative

Commercial – same as Proposed Project or 171,270 gpd

Office – 0 gpd

Hotel – same as Proposed Project or 66,105 gpd

Residential – 4,000 dwelling units or 5 x 41,220 gpd (Proposed Project) = 206,100 gpd

Ground Landscaping – 5.6 acres x 1,785 gpd/acre = 9,996 gpd

Total Retail and Residential Alternative estimated average daily potable water use: 171,270 + 66,105 + 206,100 + 9,996 = 453,471 gpd

Estimated net increase in average daily potable water use for the Retail and Residential alternative is:
453,471 gpd – 216,089 gpd = 237,382 gpd or 265.9 AFY

If the landscaped areas are irrigated with recycled water, then the estimated potable demand for this alternative decreases to 443,475 gpd and the net increase in demand is 227,386 gpd or 254.7 AFY.

Estimated Water Use for the Occupied/ReTenanted Mall Alternative

Commercial – 1,207,774 ft^2
1) Retail (847,000 ft^2): Assume 80% of space is dry goods and 20% is restaurants and food stores
Therefore the average water use rate is: 0.8 x 0.11 + 0.2 x 1.10 = 0.308 gpd/ft^2
0.75 x 0.308 gpd/ft^2 x 947,000 ft^2 = 218,757 gpd
2) Recreational & Entertainment (260,774 ft^2):
0.75 x 0.55 gpd/ft^2 x 260,774 ft^2 = 107,569 gpd
3) Total Commercial: 218,757 + 107,569 = 326,326 gpd

Office – 0 gpd

Hotel – 148/339 or 0.4366 x 66,105 = 28,861 gpd

Residential – 0 gpd

Ground Landscaping – 5.6 acres x 1,785 gpd/acre = 9,996 gpd

Total Occupied/ReTenanted Alternative estimated average daily potable water use: 326,326 + 28,861 + 9,996 = 365,183 gpd

Estimated net increase in average daily potable water use for the Retail and Residential alternative is:
365,183 gpd – 216,089 gpd = 149,094 gpd or 167.0 AFY

If the landscaped areas are irrigated with recycled water, then the estimated potable demand for this alternative decreases to 355,187 gpd and the net increase in demand is 139,098 gpd or 155.8 AFY.

Summary of Estimated Net Increase in Potable Water Use including Irrigation of Green Roof and Ground Landscape**:**

1. Proposed Project: 222,319 gpd or 249.0 AFY
2. Plan Build-out with Maximum Residential Density: 265,361 gpd or 297.2 AFY
3. Retail and Residential: 237,382 gpd or 265.9 AFY
4. Occupied/ReTenanted Mall: 149,094 gpd or 167.0 AFY

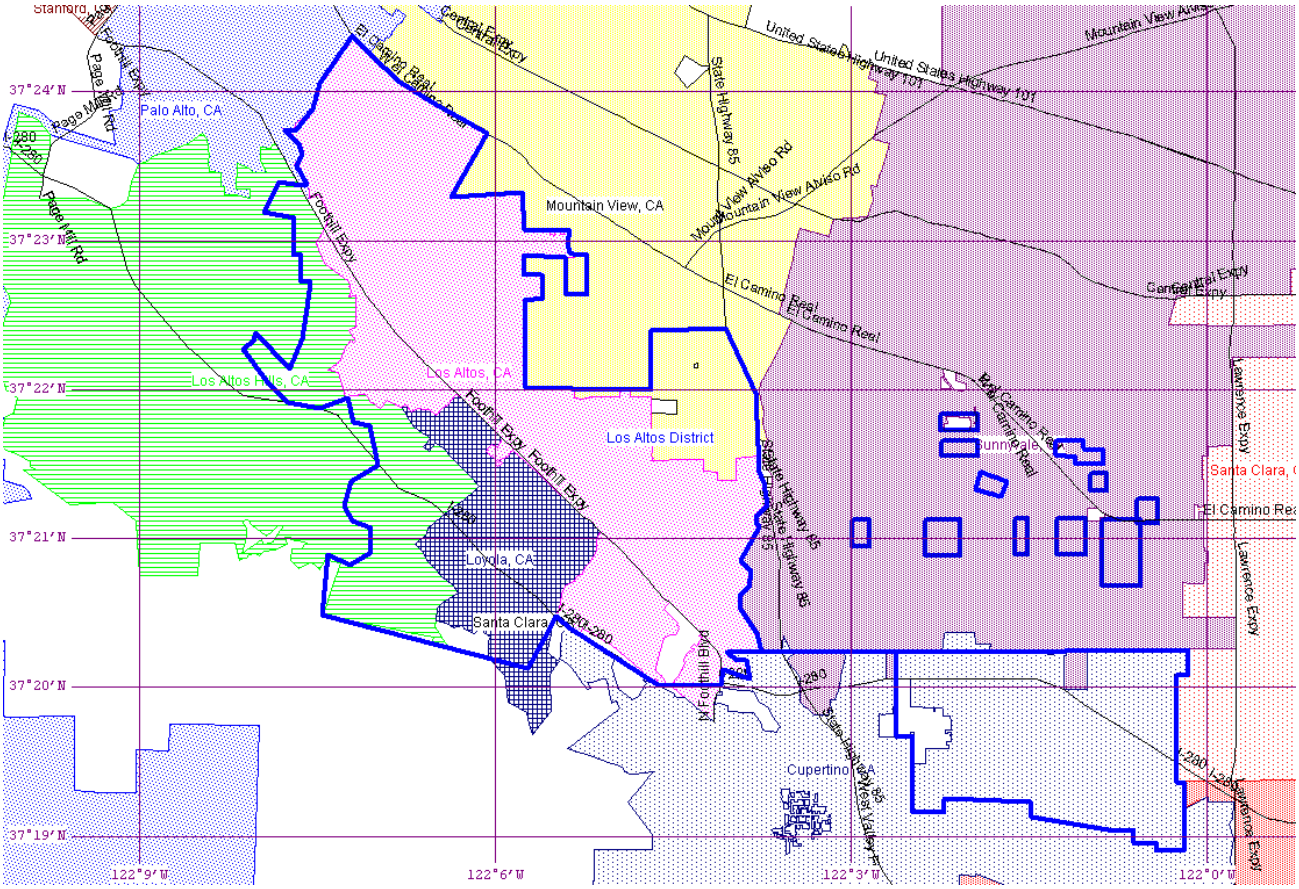
Summary of Estimated Net Increase in Potable Water Use with Recycled Water for Irrigation of Green Roof and Ground Landscape**:**

1. Proposed Project: 157,919 gpd or 176.9 AFY
2. Plan Build-out with Maximum Residential Density: 201,036 gpd or 225.2 AFY
3. Retail and Residential: 227,371gpd or 254.7 AFY
4. Occupied/ReTenanted Mall: 139,082 gpd or 155.8 AFY

LAS District Background Information

The Los Altos District is located in Santa Clara County approximately 45 miles south of San Francisco and 11 miles north of San Jose. The system serves the majority of the incorporated city of Los Altos, portions of the cities of Cupertino, Los Altos Hills, Mountain View, Sunnyvale and adjacent unincorporated areas of Santa Clara County. The service area boundaries are shown in Figure 1. The cities of Mountain View, Sunnyvale, Cupertino and Santa Clara own and operate water systems northeast and southeast of the District. Purissima Hills Water District serves the remaining portion of the Town of Los Altos Hills.

Figure 1: LAS District Service Area (Areas bounded by blue line)



Cal Water uses U.S. Census data in estimating population in all of its districts in California. Its methodology for estimating existing and future population has been reviewed and accepted by the California Public Utilities Commission (CPUC), which provides regulatory oversight of privately owned water and wastewater utilities. Estimates of the population serviced by Cal Water in the LAS district are based on overlaying the 2010 U.S. Census Tract Block data with the service area boundary as shown in Figure 4. LandView 5 and MARPLOT® software are used to generate data.

When compared to year 2000 Census data, the 10 year population growth rate in Cal Water's LAS district service was 18.8% based on a 2000 population census based estimate of 55,177 and a 2010 population census based estimate of 65,550. This was increase of 10,373 persons in 10 years or average annual increase of 1,037 persons. Total housing units (single family and multi-family) increased from 21,258 to 25,301 or 4,043 units in 10 years for an average annual increase of 404 units.

Based on 2010 U.S. Census data, occupant density is 2.59 persons per residential unit (single family and multifamily units).

This data was used as a baseline for estimating population starting in 2010. To calculate estimated population after 2010, the Census 2010 population was divided by the total number of dwelling units served by Cal Water in 2010 to produce a population density value. This value was then multiplied by the number of projected dwelling units in each future year.

The twenty-year growth rate for customer service types was used by Cal Water to estimate the future number services to 2040 and population in the LAS District. Use of the twenty-year growth rate correlated most closely with past growth and current growth trends. In the 2010 UWMP, Cal Water estimated the LAS district service area population to be 56,940. As noted, using 2010 US Census data, Cal Water revised its 2010 estimate to 65,550, which is a difference of 8,610 or 15.1 % greater.

In the 2015 LAS District UWMP, Cal Water estimated the service area population to be 68,604 in 2015. Service area population increased at an average annual rate of 1.46 percent from 2000 to 2015 primarily because of the expansion of the service area. Between the 2000 and 2010 Censuses, population increased at an average annual rate of 1.74 percent. Between 2010 and 2015, increase slowed to an average annual rate of 0.92 percent per year. Service area population is projected to increase at a rate of 0.91 percent annually to 2040. This is based on the long-term growth rate of single-family housing units and an increase in construction of multi-family housing units.

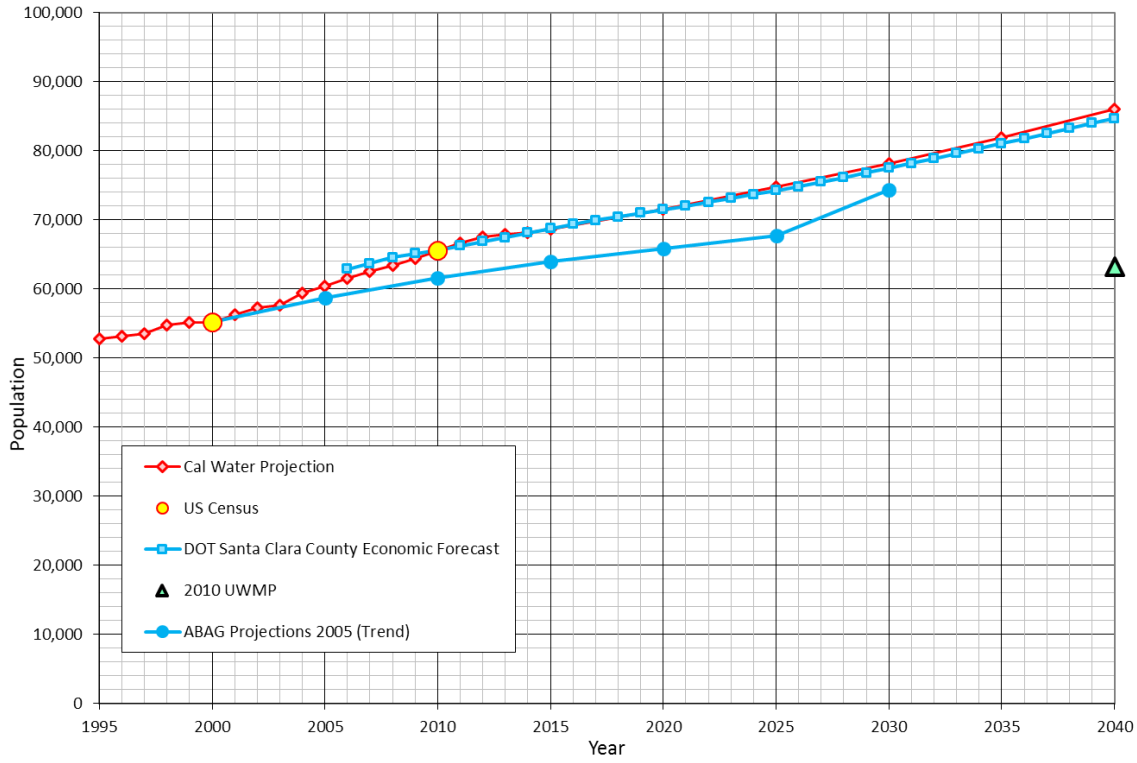
Cal Water's service area population forecast is shown in Table 1. This forecast is used in the WSA.

Table 1: LAS District Population - Current and Projected

	2015	2020	2025	2030	2035	2040
Population Served	**68,604**	**71,536**	**74,714**	**78,163**	**81,909**	**85,980**

A comparison of various population projections is shown in Figure 2

Figure 2: LAS District Population Projection Comparison



LAS District Water Demand

Actual LAS District water use in 2015 by customer category is shown in Table 2. Total system demand in 2015 was 10,188 AF. Water use in 2015 was strongly affected by the Drought Emergency Regulation adopted by the State Water Resources Control Board in May of 2015 (SWRCB Resolution No. 2015-0032). The Drought Emergency Regulation mandated urban retail water suppliers reduce potable water use between June of 2015 and February of 2016 by percentage amounts specified by the State Water Resources Control Board. The LAS District was ordered to reduce potable water use by 32 percent over this period relative to use over the same period in 2013. Between June and December 2015, water use was 38.3 percent less than water use over the same period in 2013.

Table 2: LAS District Demands for Potable Water

Use Type	2015 Actual	
		Quantity (AF)
Single Family		6,615
Multi-Family		595
Commercial		1,930
Industrial		11
Institutional/Governmental		436
Other		16
Losses		585
	Total	**10,188**

Residential customers account for approximately 92 percent of services and 76 percent of water use in the District, most of which is associated with single-family residences. Figure 4-1 shows the distribution of services in 2015. Figure 3 shows historical water sales by customer category.

Figure 3: LAS District Demand by User Class for 2015

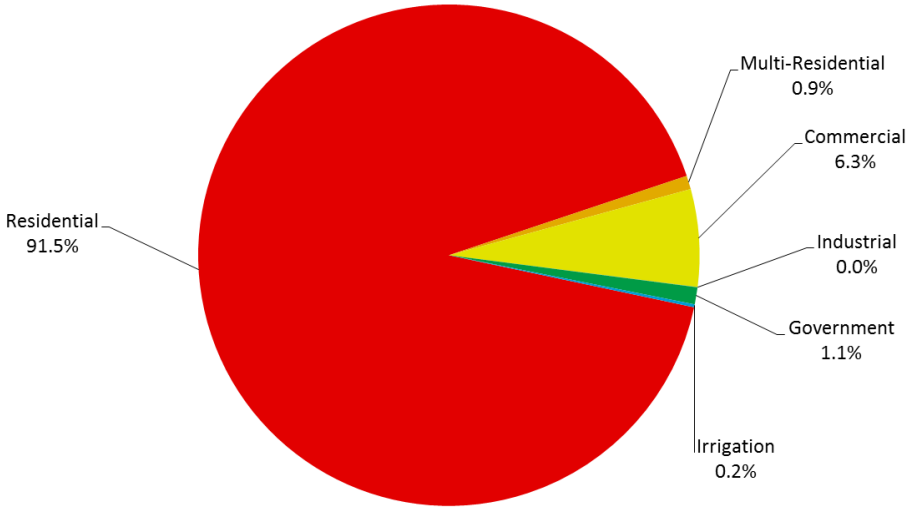
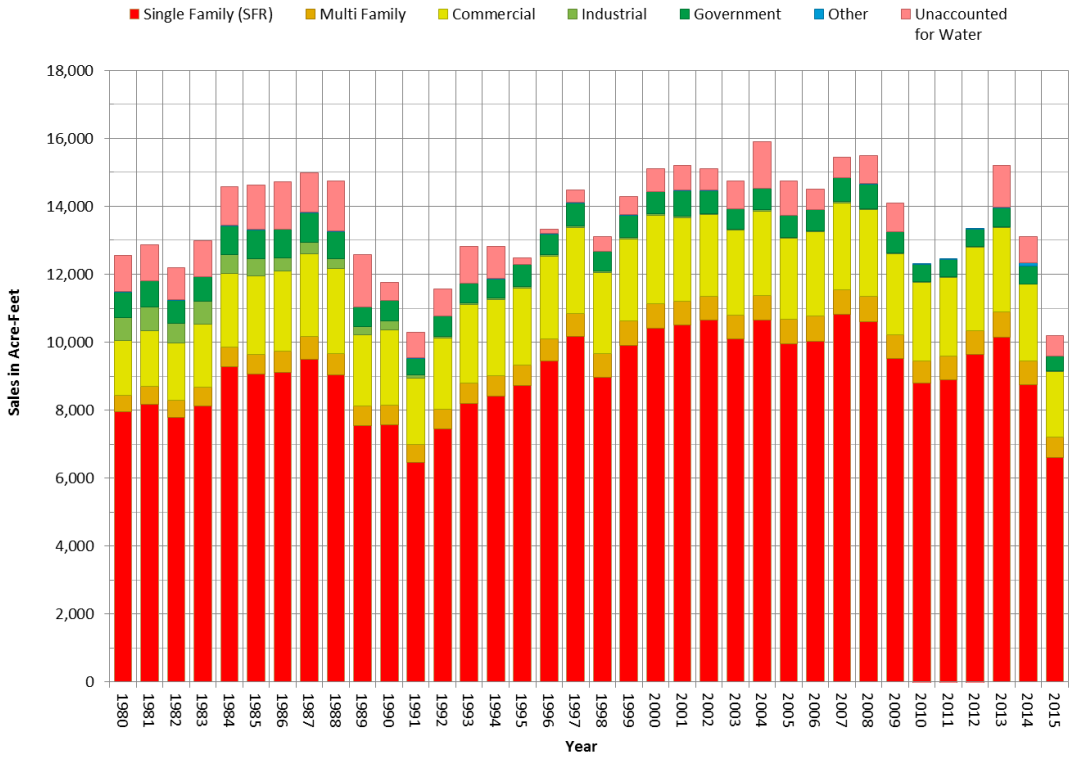


Figure 4 shows historic water use for all user classes.

Figure 4: LAS District Historic Water Use (2015 Data)



California Senate Bill x7- 7 Baseline and Targets

Senate Bill No. 7 (SBx7-7) adopted in November 2009 mandates a statewide 20% reduction in per capita urban water use by December 31, 2020. The CPUC directed Class A and B water utilities to adopt conservation programs and rate structures designed to achieve reductions in per capita water use. To increase water conservation, Cal Water in 2010 developed five-year conservation program plans for all of its service districts. The LAS District Conservation Master Plan is in Appendix G of the 2015 UWMP.

SBx7-7 required reducing per capita water use by at least 10 percent on or before December 31, 2015. Urban retail water suppliers are to develop 2015 and 2020 water use targets in accordance with alternative methods and specific requirements. Retail water suppliers can also form regional alliances within the same hydrologic region to achieve compliance.

Annual LAS District per capita demand for the 20 year period between 1995 and 2014 ranged from a high of 244 gpcd in 2000 to a low of 152 gpcd in 2011. The 2015 annual per capita demand was 132.5 gpcd – a decrease, which is viewed as the result of LAS District customers responding to intensified efforts by Cal Water, SCVWD and the state to achieve the 20% reduction in water mandated by the Governor of California. In its updated projections, Cal Water increases per capita daily water demand to 184 gpcd in 2020 and beyond assuming that after the current drought ends, normal or above normal annual rainfall and runoff will occur. An increase in per capita water consumption has been observed in previous years following droughts. The 184 gpcd is still less than the adjusted 2015 and 2020 SBx7-7 targets.

Expected water use per service, shown in Figure 5, is based on weather-normalized historical use, adjusted for future expected water savings from plumbing codes and District conservation programs. Weather normalization of historical use was done econometrically using the California Urban Water Conservation Council GPCD Weather Normalization Methodology. Expected water savings from plumbing codes are presented in Section 4.4 of the LAS District UWMP. Expected water savings from District conservation programs and projected compliance with the District's SB X7-7 2020 per capita water use target are discussed in Chapter 9 of the 2015 LAS District UWMP. The projected trend in average use per service shown in Figure 5 does not account for possible effects of climate change on future demand. The potential effects of climate change on demand are discussed in Section 4.6 of the LAS District UWMP.

Projected water uses in Figure 5 and Table 3 are based on unrestricted demands under normal weather conditions. Demands are assumed to partially rebound by 2020 from 2015 levels due to the State Water Resources Control Board's ending its mandatory water use reductions in 2016, which occurred.

Figure 5: Historical and Projected Average Use per Service in Gallons per Day

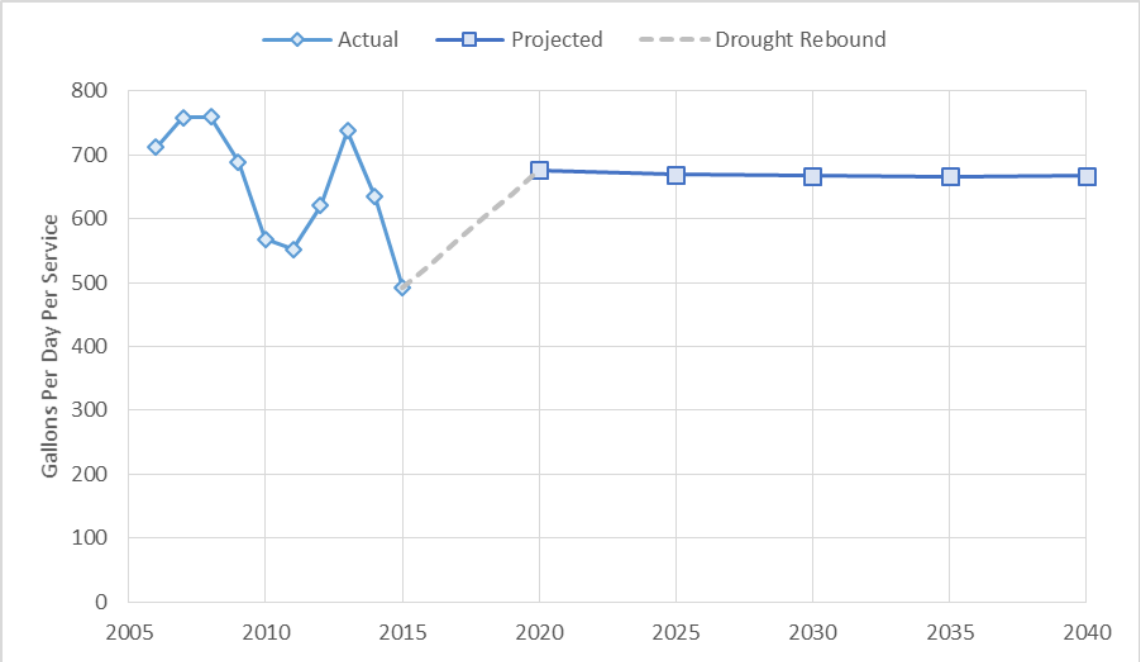


Table 3: LAS District Projected Water Demands					
Use	(AF)				
	2020	2025	2030	2035	2040
Single Family	9,756	9,750	9,787	9,842	9,909
Multi-Family	865	901	960	1,034	1,122
Commercial	2,465	2,442	2,445	2,448	2,454
Industrial	20	20	20	20	20
Institutional/Governmental	636	657	681	705	731
Other	28	28	28	28	28
Losses	387	392	397	403	408
Total	**14,156**	**14,190**	**14,318**	**14,480**	**14,673**

From 2020 to 2040, projected water demand is based on multiplying updated population projections in Table 1 by varying per capita water use rates.

Vallco ASP Proposed Project and Alternatives and LAS District Demand

The estimated completion and full occupancy date of the Proposed Project and Alternatives is January 2029. It is estimated that 50% of estimated increased new demand will occur by 2025 and the balance or 100% by 2029.

Actual water use in the LAS District in 2017 was 11,656 AF compared to 10,188 AF for 2015 or an increase of 1,468 AF in two years. The increase in water use was mainly due to the lifting of the mandatory water use reductions.

The projected LAS District water use in 2030 is 14,318 AF; therefore, the projected increase in demand between 2017 and 2030 is 2,662 AF.

Expressed as percentages of the increase in demand between 2017 and 2030, the estimated net new water demand of the Proposed Project and three alternatives assuming the green roof and ground landscaping are irrigated with potable water are as follows. Also, shown are the percentages of net new demand based on total 2030 demand.

1. Proposed Project: 9.3% (249/2,662); or 1.7% of total 2030 demand
2. Plan Build-out with Maximum Residential Density: 11.2% (297.2/2,662); or 2.0% of total 2030 demand
3. Retail and Residential: 10.0% (265.9/2,662); or 1.8 % of total 2030 demand
4. Occupied/ReTenanted Mall: 6.2% (167/2,662) or 1.2% of total 2030 demand

Again, as percentages of the increase in demand between 2017 and 2030, estimated net new water demand of the Proposed Project and three alternatives assuming the green roof and ground landscaping are irrigated entirely with recycled water are as follows. These are followed by percentages of net new demand based on total 2030 demand.

1. Proposed Project: 6.6% (176.9/2,662); or 1.2% of total 2030 demand
2. Plan Build-out with Maximum Residential Density: 6.6% (225.2/2,662); or 1.6% of total 2030 demand
3. Retail and Residential: 8.4% (225.2/2,662); or 1.6% of total 2030 demand
4. Occupied/ReTenanted Mall: 5.8% (155.8/2,662); or 1.1% of total 2030 demand

Water demands of the Apple Campus 2 project are estimated in a SB 610 WSA, February 1, 2012. Total potable and non-potable estimated water use for Apple Campus 2 Phases 1 and 2 is 520 AFY for the water conserving scenario, which was selected and has been implemented. As presented in the Apple Campus 2 WSA, potable water use at build out was estimated to be 242 AFY and recycled water for landscape irrigation, interior fixtures and process water requirements was estimated to be 278 AFY.

Cal Water, City of Sunnyvale, Apple, and SCVWD entered into agreement to provide recycled water to Apple Campus from the Sunnyvale recycled water system. A recycled water transmission line has been constructed to the Apple Campus 2 site to deliver 175 AFY or 103 AFY less than the 278 AFY estimated in the Apple Campus 2 WSA. Accordingly, 103 AFY of water demand is added to the estimated potable demand of 242 AFY to yield a revised total

potable water demand of 345 AFY for Apple Campus 2 at full occupancy. Total demand is still estimated to be 520 AFY.

Total estimated existing potable water use site area prior to the Apple Campus 2 project was estimated to be 398.4 AFY.

Therefore, the net increase in water demand by the Apple Campus 2 project is 121.6 AFY. Since 175 AFY of demand will be met by non-potable water, the net effect on potable supply of the Apple Campus 2 project is to decrease demand on the potable supply by 53.4 AFY.

A WSA has been prepared by Cal Water for the Hamptons Project. That WSA estimates the increased demand for the proposed project to be 28.1 AFY.

In a February 29, 2012, letter, the City of Cupertino requested that Cal Water review its SB 610 Water Supply Assessment (WSA) dated August 12, 2008 for the Main Street Development Project with respect to two proposed additional alternative development options that differ from the two options assessed in the WSA. The City requested that changes to the base scheme option be assessed for their impact on project water demand. In a March 21, 2012 response to the City Cal Water compared the estimated water demand for Option 1D (base scheme) to Plan A, the higher water use option in the 2008 WSA. In Cal Water's Addendum No. 1 to the WSA, dated March 21, 2012, the estimated water demand for Option 1D (Base Scheme) is 268,580 gpd compared to the August 12, 2008, WSA estimated demand for Plan A of 265,400 gallons/day. The demand for Option 1D, used here, is: 30.1 AFY.

The estimated water demands for the 1) Plan Build out with Maximum Residential Density (highest projected water use for the Vallco ASP), 2) Hamptons Project, 2) Apple Campus 2 using recycled water and the typical development scenario and 4) Main Street Development Project are added to Cal Water's 2015 LAS District demand projection shown in Table 2 resulting in a revised LAS District demand projection shown in Table 4.

Table 4: LAS District Plus Four Development Projects

Actual and Projected Water Demand (AF)

	2005	2010	2015	2020	2025	2030	2035	2040
LAS District	14,758	11,648	10,188	14,156	14,190	14,318	14,480	14,673
Hamptons Project	0	0	0	28.1	28.1	28.1	28.1	28.1
Vallco Plan Build Out	0	0	0	0	148.6	297.2	297.2	297.2
Apple Campus 2	0	0	0	121.6	121.6	121.6	121.6	121.6
Main Street Project	0	0	0	30.1	30.1	30.1	30.1	30.1
Total	14,758	11,648	10,188	14,336	14,518	14,795	14,957	15,150

LAS District Water Demand Management

Cal Water has significantly expanded its water conservation programs. State law, CPUC directives and a state water conservation organization are focused on reducing urban water use and have provided much of the impetus. This includes:

1. Recent decisions by the CPUC directing regulated water utilities to reduce per capita urban water demand.
2. State legislation mandating urban water suppliers reduce per capita demand 20 percent by 2020.
3. Memorandum of Understanding Regarding Urban Water Conservation in California (MOU).

The projections of future water use incorporate expected water savings from plumbing codes and appliance standards for residential and commercial toilets, urinals, clothes washers, dishwashers, and showerheads. These savings are commonly referred to as *passive water savings* to differentiate them from water savings resulting from water supplier conservation programs, which are termed *active water savings*. Active water savings resulting from the LAS District's implementation of demand management measures are discussed in Chapter 9 of the 2015 UWMP. The estimates of passive water savings in Table 5 were developed with the Alliance for Water Efficiency's *Water Conservation Tracking Tool* using data on the vintage, number, and water using characteristics of residences and businesses within LAS District's service area.

Table 5: LAS District Estimated Passive Savings (AF)

	2015	2020	2025	2030	2035	2040
Passive Savings	12	187	332	450	549	632

The following codes and standards are the basis for estimated passive water savings:

- AB 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014 cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not consume more than 0.125 gallons per flush, 75% less than the standard set by AB 715.

- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. Water use efficiency is summarized by the water factor for the appliance which measures the gallons of water used per cycle per cubic foot of capacity. A typical top-loading residential clothes washer manufactured in the 1990s had a water factor of around 12. In 2015, the allowable water factor for top- and front-loading residential clothes was reduced to 8.4 and 4.7, respectively. In 2018, water factor standard for top-loading residential clothes washers has been reduced to 6.5. In 2010 the allowable water factor for top- and front-loading commercial clothes washers was reduced to 8.5 and 5.5, respectively.

The maximum water factor for Energy Star compliant top- and front-loading washers is 3.7 and 4.3, respectively. An Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. Federal dishwasher water use efficiency standards were last updated in 2013. The maximum water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.

- New construction and renovations in California are now subject to CalGreen Code requirements. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20% reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.

- SB 407, enacted in 2009, mandates that all buildings in California come up to current State plumbing fixture standards within this decade. This law establishes requirements that residential and commercial property built and available for use on or before January 1, 1994 replace plumbing fixtures that are not water conserving, defined as "noncompliant plumbing fixtures" as follows:
    - any toilet manufactured to use more than 1.6 gallons of water per flush;
    - any urinal manufactured to use more than one gallon of water per flush;
    - any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute; and
    - any interior faucet that emits more than 2.2 gallons of water per minute.

  For single-family residential property, the compliance date was January 1, 2017. For multi-family and commercial property, it is January 1, 2019. In advance of these dates, the law requires effective January 1, 2014 for building alterations and improvements to all residential and commercial property that water-conserving plumbing fixtures replace all noncompliant plumbing fixtures as a condition for issuance of a certificate of final completion and occupancy or final permit approval by the local building department.
  SB 407 also requires effective January 1, 2017 that a seller or transferor of single-family residential property disclose to the purchaser or transferee, in writing, the specified requirements for replacing plumbing fixtures and whether the real property includes noncompliant plumbing. Similar disclosure requirements go into effect for multi-family and commercial transactions January 1, 2019. SB 837, passed in 2011, reinforces the disclosure requirement by amending the statutorily required transfer disclosure statement to include disclosure about whether the property is in compliance with SB 407 requirements. These two laws require retrofit of non-compliant plumbing fixtures upon resale or major remodeling for single-family residential properties effective January 1, 2017 and for multi-family and commercial properties effective January 1, 2019.

- SB 7, enacted in 2016, requires a water purveyor that provides water service to a newly constructed multiunit residential structure or newly constructed mixed-use residential and commercial structure that submits an application for a water

connection after January 1, 2018, measure the quantity of water supplied to each individual dwelling unit as a condition of new water service and permit the measurement to be by individual water meters or submeters. This bill intends to encourage the conservation of water in multiunit structures.

California has also adopted regulations governing the future use of landscape water use.

- The California Water Commission approved the State's updated Model Water Efficient Landscape Ordinance (MWELO) on July 15, 2015. The updated MWELO supersedes the State's MWELO developed pursuant to AB 1881. Local agencies had until December 1, 2015 to adopt the MWELO or to adopt a Local Ordinance which must be at least as effective in conserving water as MWELO. Local agencies working together to develop a Regional Ordinance have until February 1, 2016 to adopt. The size of landscapes subject to MWELO has been lowered from 2500 sq. ft. to 500 sq. ft. The size threshold applies to residential, commercial, industrial and institutional projects that require a permit, plan check or design review. Additionally, the maximum applied water allowance (MAWA) has been lowered from 70% of the reference evapotranspiration (ETo) to 55% for residential landscape projects, and to 45% of ETo for non-residential projects. This water allowance reduces the landscape area that can be planted with high water use plants such as cool season turf. For typical residential projects, the reduction in the MAWA reduces the percentage of landscape area that can be planted to high water use plants from 33% to 25%. In typical non-residential landscapes, the reduction in MAWA limits the planting of high water use plants to special landscape areas. The revised MWELO allows the irrigation efficiency to be entered for each area of the landscape. The site-wide irrigation efficiency of the previous ordinance (2010) was 0.71; for the purposes of estimating total water use, the revised MWELO defines the irrigation efficiency (IE) of drip irrigation as 0.81 and overhead irrigation and other technologies must meet a minimum IE of 0.75.

- CalGreen requires that automatic irrigation system controllers for new landscaping provided by a builder and installed at the time of final inspection must be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plant water needs as weather or soil conditions change.

The estimates of future water savings in Table 4 do not include potential landscape water savings from implementation of MWELO or CalGreen because estimating these savings required data that was not available to the District at the time this plan was prepared, including data on existing and future landscape areas, plant materials, irrigation equipment, and probable enforcement of and compliance with the landscape design and irrigation equipment requirements.

There are three ways in which a water supplier can comply with the MOU. The first is to implement a set of water conservation best management practices (BMPs) according to the requirements and schedules set forth in Exhibit 1 of the MOU. The second way, called Flex Track compliance, is to implement conservation programs expected to save an equivalent or greater volume of water than the BMPs. The third, similar to SBx7-7, is to reduce per capita water use.

Cal Water used Flex Track to estimate expected water savings over the 10-year period (2009-2018) were it to implement programmatic BMPs in accordance with MOU requirements as shown in Table 6. It can achieve these water savings through any combination of programs it selects.

Table 6: MOU Best Management Practices

BMP Group	BMP Name
1. Utility Operations Programs (F)	Conservation Coordinator
	Water Waste Prevention
	Wholesale Agency Assistance Programs
	Water Loss Control
	Metering & Volumetric Rates
	Retail Conservation Pricing
2. Education Programs (F)	Public Information Programs
	School Education Programs
3. Residential (P)	Residential Assistance Program
	Landscape Water Surveys
	High Efficiency Clothes Washer Program
	Watersense Toilet Program
	Watersense Specifications for Residential Development
4. Commercial, Industrial, Institutional (P)	Reduce baseline CII water use by 10% in 10 years
5. Landscape (P)	Large Landscape Water Budget Programs
	Large Landscape Water Surveys
F = Foundational BMP, P = Programmatic BMP	

2015 and 2020 Gallons per Capita per Day (GPCD) LAS District Targets

Urban retail water suppliers may select from four GPCD target methods (CWC 10608.20).

- Target Method 1: 20% reduction from 10-year baseline GPCD
- Target Method 2: Water use efficiency performance standards
- Target Method 3: 95% of Hydrologic Region Target
- Target Method 4: Savings by water sector, DWR Method 4

Regardless of target method selected, the final target cannot exceed 95 percent of the 5-year baseline period average GPCD (CWC 10608.22).

The LAS District selected Target Method 1, which sets the 2020 target to either 80 percent of the 10-year baseline or 95 percent of the 5-year baseline average GPCD, whichever is less. This results in a 2020 target of 185 GPCD. The 2015 interim target of 209 GPCD is the midpoint between the 10-year baseline average GPCD and the 2020 target.

The District's GPCD baselines and targets are summarized in Table 7.

Table 7: LAS District Baselines and GPCD Targets

Baseline Period	Start Years	End Years	Average GPCD	2015 Interim Target	Confirmed 2020 Target
10-15 year	1996	2005	232	209	185
5 Year	2003	2007	223		

The LAS District's 2015 compliance daily per capita water use was 133 gallons compared to its 2015 interim target of 209 gallons.
The low per capita water use in 2015 partially reflects the impacts of the Drought Emergency Regulation adopted by the State Water Resources Control Board in May of 2015 (SWRCB Resolution No. 2015-0032). Among other things, the Drought Emergency Regulation mandated urban retail water suppliers reduce potable water use between June of 2015 and February of 2016 by percentage amounts specified by the State Water Resources Control Board. The LAS District was ordered to reduce potable water use by 32 percent over this period relative to use over the same period in 2013.However, the Drought Emergency Regulation does not explain all of the decline in per capita water use, which has been trending downward since 2000 when it reached 244 GPCD. By 2014 this had fallen by 30 percent, to 172 GPCD. Between 2014 and the end of 2015, per capita water use had fallen an additional 23 percent, to 133 GPCD.

Demand Management Measures (DMM)

Cal Water centrally administers its conservation programs for its 24 districts. DMM programs are grouped in the following categories in Section 10631(f) of the UWMP Act:
(i) Water waste prevention ordinances
(ii) Metering
(iii) Conservation pricing
(iv) Public education and outreach
(v) Distribution system water loss management
(vi) Water conservation program coordination and staffing support
(vii) Other demand management measures

Following are summaries of these programs.

Water Waste Prevention Ordinances

Cal Water enforcement of water use restrictions is authorized by the CPUC through Rule 14.1 or Schedule 14.1. Restrictions may also be regulated by ordinances passed by the local governments. In the LAS District, the Cities of Cupertino, Mountain View, and Sunnyvale have passed water conservation ordinances, which are included in Appendix J of the 2015 UWMP. Due to worsening drought conditions, Cal Water filed Schedule 14.1 with the CPUC in the spring of 2015 which went into effect on June 1, 2015. Cal Water's Schedule 14.1 filing, which applies to both residential and non-residential customers, was responsive to the Governor's emergency drought declaration and executive order requiring a statewide 25% reduction in urban potable water use. It also complies with regulations adopted by the State Water Resources Control Board (State Board) and the CPUC to achieve that reduction by the end of February 2016. Schedule 14.1 put measures in place to enable Cal Water to enforce water-use prohibitions set by the State Board, including:

- Applying water to outdoor landscapes that causes runoff onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures
- Using a hose to wash motor vehicles unless the hose is fitted with a shut-off nozzle or device that causes it to cease dispensing water immediately when not in use
- Applying water to driveways and sidewalks

- Using water in a fountain or other decorative water feature, except where the water is part of a recirculating system
- Applying water to outdoor landscapes during and within 48 hours after measurable rainfall
- Using potable water to irrigate outside of new construction without drip or micro-spray systems
- Using potable water on street medians
- Filling or refilling ornamental lakes or ponds except to sustain existing aquatic life

Additionally, Schedule 14.1 requires that:

- Customers must fix leaks within their control within five business days of notification
- Hotel/motel operators must provide option to not have towels or linens laundered daily during a guest's stay, and must provide clear notice of this option in easy-to-understand language
- Restaurants and other eating and drinking establishments may only serve drinking water upon request

With the approval of the Schedule 14.1 filing, beginning June 1, 2015, individual customers in each Cal Water district were provided water budgets based upon their water use each month in 2013 minus the state-mandated reduction for the Los Altos Suburban District of 32%. If a customer used less than his or her water budget, the unused water was carried forward, similar to rollover minutes on a cell phone plan. Water used in excess of the monthly budget was subject to a drought surcharge. The surcharge was discounted for customers on Cal Water's Low-Income Rate Assistance (LIRA) program. To help with compliance, the customer's monthly bill showed the water budget for the following month. Customer's water use history back to 2011 and their water budgets were available online
Cal Water's Schedule 14.1 filing is included as Appendix J of the 2015 UWMP.

Metering

All service connections within the LAS District are metered. Meters are read monthly and routinely maintained and calibrated.

Conservation pricing

Starting in 2008, Cal Water adopted tiered usage rates for single family residential services. Uniform use rate designs still apply to the other water user types. Conservation pricing provides economic incentives to customers to use water more efficiently.
The LAS District's rate structure complies with Option 1 of the Urban MOU's definition of conservation pricing. Urban MOU BMP compliance reports are provided in Appendix I of the 2015 UWMP.

Public Education and Outreach

Cal Water's public outreach program is comprised of four components:
Residential Customer Assistance

Non-Residential Customer Assistance
Public Information and School Education
Rebate Program Information and Marketing

Programs for Reducing Distribution System Losses

Cal Water annually quantifies the LAS District's apparent and real water losses. Conservation staff using the AWWA water audit method and component analysis process has completed water balances for all Cal Water districts. For the three-year period 2013-2015, apparent and real water loss in the LAS District averaged 857 AF, or about 7 percent of total production.
In addition to its routine and planned system maintenance and water loss reporting, in 2017 Cal Water implemented a lift-and-shift sonic data logger leak detection program in the LAS District. The lift-and-shift program surveys up to one-third of main miles annually in three shifts. Lift-and-shift sonic data logging technology will enable Cal Water to quickly and efficiently locate leaks in one part of the water distribution system and then redeploy the equipment to another part. Cal Water estimates this program will reduce real water loss in the District by 40 AFY. Additional potential benefits of the program include reduced excavation of streets, less staff overtime spent responding to and repairing catastrophic main breaks, and improvement to the best management practices of the valve maintenance program.

LAS District Water Supply

Water supply for the LAS District is from Cal Water wells and purchased treated water from SCVWD. During the last 5 years approximately 35% of total supply was from Cal Water wells and 65% was purchased water from SCVWD.

The amount of groundwater pumped annually from Cal Water wells depends upon the supply available from SCVWD. SCVWD imports surface water to the region through the South Bay Aqueduct of the State Water Project (SWP), the San Felipe Division of the Federal Central Valley Project (CVP), and through the San Francisco Public Utilities Commission's (SFPUC) Regional Water System. However, Cal Water only receives water from the SWP and CVP.

Purchased SCVWD water projections are based on historical trends being extended to 2040 and include "Non-Contract" water. In SCVWD's 2012 Water Supply and Infrastructure Master Plan baseline supplies are projected to increase from 398,000 AFY in 2012 to 421,000 AFY in 2035 or an average annual increase of 1,000 AFY per year. In addition, water conservation savings are projected to increase from 53,000 AFY in 2012 to 99,000 AFY in 2030 or an average annual increase in savings of 2,555 AFY per year. So the effective SCVWD increase in supply including water conservation savings is 3,555 AFY. The LAS District's share of SCVWD's average annual effective supply increase is about 2.2%

Groundwater supply projections are based on groundwater production being set to meet the difference between LAS District demand and supply deliveries from SCVWD in a given year. Cal Water has more than adequate well capacity to meet projected demands through 2040. As wells reach the end of their useful life are taken out of service, they are replaced with new wells.

Table 8 presents the supply plan to match the projected LAS District demand projection in Table

4. Assuming no water supply shortages and based the amount of potable water delivered by SCVWD to the LAS District and a constant annual use of recycled water from SCVWD for non-potable use on the Apple Campus 2 site and other future sites, Cal Water will pump groundwater from its wells to meet demand.

Table 8: LAS District Actual and Projected Water Supplies (AF)

Water Supply Sources	2010	2015	2020	2025	2030	2035	2040
SCVWD Purchased Water	8,887	6,846	10,400	10,600	10,800	11,000	11,200
Groundwater Wells	3,892	3,342	3,716	3,657	3,734	3,696	3,689
Recycled Water	0	0	220	261	261	261	261
Total	11,648	10,188	14,336	14,518	14,795	14,957	15,150

SCVWD Purchased Water

Cal Water has a contract to 2035 with SCVWD to purchase treated surface water and convey it to the LAS District. SCVWD owns and operates three separate water treatment plants (Penitencia, Rinconada, and Santa Teresa) to produce supplies for its retail utilities. Finished water is delivered to the LAS District from the Rinconada treatment plant through the West Pipeline, a large-diameter pipe that runs through Cupertino and along the Foothill Expressway. The LAS District takes SCVWD water from four locations in the system - the "Tantau-Vallco", "Granger", "Farndon", and "Covington" turnouts. The Farndon and Granger turnouts are located directly on the West Pipeline, while the Tantau-Vallco turnout is located on the Santa Clara Distributary, and the Covington connection is located on the Mountain View Distributary.

When surface water supplies are plentiful, SCVWD authorizes the sale of "Non-Contract" water in order to facilitate conjunctive use storage of surplus supply in groundwater aquifers in the region. Because there is usually an economic advantage to purchasing "Non-Contract" water, the LAS District reduces production of groundwater and increases its purchase of surface deliveries from SCVWD. When supplies are scarce, SCVWD has imposed both voluntary and mandatory reductions in the use of water. Because surplus supplies are stored underground by SCVWD when available, during shortages the District increases groundwater production and reduces the direct purchase of water from SCVWD.

Because SCVWD replenishes the groundwater resources within its boundaries, it levies an assessment on the production of groundwater to finance this operation. During normal periods of supply, the groundwater pumping assessment is set such that the cost of pumping groundwater is essentially equal to the cost of directly purchasing water from SCVWD. Because it is unknown whether "Non-Contract" water will be available when the purchase water schedules are prepared, and because "Non-Contract" water is only available in the non-summer months between October and April of the next year, the scheduling of deliveries is set to maximize the delivery of purchased water in the summer and utilize groundwater production capacity to its fullest during all other periods. This scheduling pattern enables the LAS District to take

advantage of the economic incentive provided by the sale of "Non-Contract" water and assist SCVWD in accomplishing the goal of storing surplus supplies. SCVWD has scheduling restrictions regarding the purchase of direct deliveries. These restrictions currently limit the Peak Day deliveries to 180 percent of the average day delivery; the maximum monthly delivery cannot exceed fifteen percent of the annual scheduled delivery.

SCVWD prepared a 2012 Water Supply and Infrastructure Master Plan (WSIP) which indicates that the basis for its sustainable water supply strategy is to: 1) secure existing supplies and infrastructure, 2) optimize use of existing supplies and infrastructure, and 3) increase recycling and conservation. The WSIP states it will "secure existing supplies and facilities for future generations". In addition, SCVWD will make more effective use of its existing assets. It is committed to working with its retail utilities to meet Silicon Valley's future increases in water demand through conservation and recycling. The 2012 WSIP takes into account climate changes and reduced imported supplies and is based on the 2010 UWMPs prepared by its member utilities. It is intended to be responsive to stakeholder needs and provide adequate supplies and delivery infrastructure through 2035. Baseline water supplies are expected to increase from the current average of about 398,000 AFY to an average of 421,000 AFY in 2035. The increase in baseline supplies is due to removal of operating restrictions on existing reservoirs and increased non-potable water recycling. Baseline conservation savings are projected to increase from about 53,000 AFY in 2011 to about 99,000 AFY by 2030. These savings are expected to reduce demands on the water supply system and the need for more capital-intensive improvements. SCVWD indicates that adequate investment in its infrastructure system is critical to supply reliability. Some key elements of SCVWD's plan are:

1) **Groundwater Recharge:** new ponds will add about 3,300 AFY on average.
2) **Reservoir Pipeline:** A connection between Lexington Reservoir and the raw water system will provide greater flexibility in using existing local water supplies and will allow surface water from Lexington Reservoir to be put to beneficial use elsewhere in the county, especially when combined with the indirect potable reuse project. In addition, the pipeline will enable SCVWD to capture some wet-weather flows that would otherwise flow to the Bay. The pipeline will provide an average annual yield of 1,500 AFY.
3) **Imported Water Reoperations:** SCVWD will re-operate its Semitropic Groundwater Bank when it is nearly full and SCVWD water supply needs are otherwise met to sell or exchange up to 50,000 AFY of stored water. This would create additional space in the Semitropic Groundwater Bank for carryover of supplies during wetter years, maximize the value of SCVWD's existing assets (imported water contracts and investment in the Semitropic Groundwater Bank), and potentially help fund investments in infrastructure and additional local supplies.
4) **Increase Recycling and Conservation:** SCVWD's supply sustainability strategy relies upon development of indirect potable reuse to provide most of the new water supply to meet future water needs. The WSIP assumes that at least 20,000 AFY of advanced treated recycled water will be used for groundwater recharge by 2030. Currently, SCVWD is in the process of accelerating the expansion of its existing Silicon Valley Advanced Water Purification Center (SVAWPC) which has an existing production capacity of 8 mgd (8,970 AFY) to probably 32 mgd (35,870 AFY) by mid-2020 and using the product water

for recharging groundwater aquifers for potable use.

Details on the availability and scheduling of SCVWD surface water deliveries are described further in Section 6.1 of the LAS District 2015 UWMP.

Groundwater

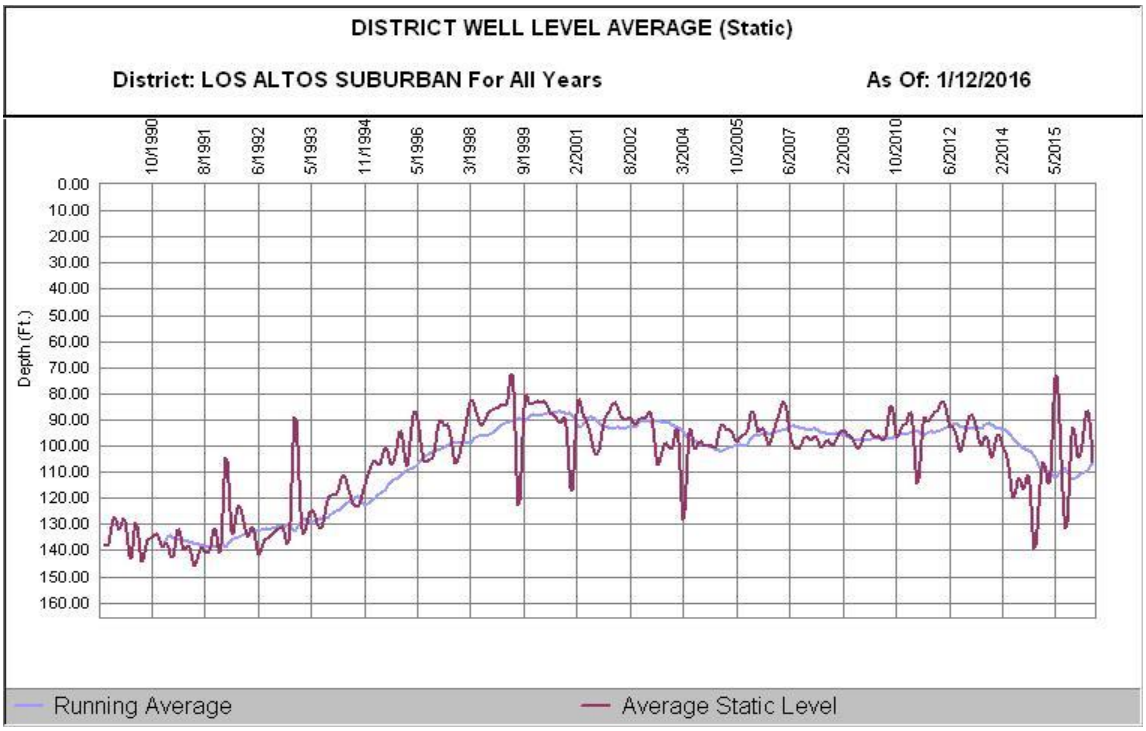
Cal Water has more than sufficient well capacity to meet the demands not met by SCVWD purchases through 2040. As older wells are taken out of service and replaced with new wells, the system's total capacity is expected to only marginally increase.
Maximum day demands, both current and projected, are supplied by deliveries of imported water from SCVWD. Production records show that average day demand reached a high of 14.19 MGD in 2004. The ten-year average through 2014 was 12.36 MGD. The maximum day demand reached 28.72 MGD in 2001 with a ten-year average of 22.32 MGD. The 10-year average values result in a typical maximum day to average day ratio of 1.81. Historically, the District's distribution facilities have been able to deliver this level of demand.
Average static groundwater elevations in the District have remained relatively consistent since the SCVWD began its recharge activities. Over the period of record the level has fluctuated due to varying hydrologic conditions. As shown in Figure 6, the extended multi-year drought in the early 1990's caused a 40-foot decline in static groundwater elevation. Drought recovery began in 1992, with an increase in the average static groundwater elevation to pre-drought levels. Elevations again declined in 2014-15.

The LAS District has 20 wells, which are currently active and operational. The wells have a combined design capacity of 14,440 gpm, which is 20.79 million gallons per day (mgd). Operated continuously at 90% of design capacity, the wells could produce 20,980 AFY. While the LAS District has not had the need to operate its wells continuously, it has produced 650 to 750 AF in a given month or 9,000 AFY, which is only 43% of 20,980 AFY.

Maximum day demands, both current and projected, are supplied by deliveries of treated water from SCVWD. Production records show that average day demand reached a high of 13.83 mgd (15,504 AFY) in 2008 and has a ten-year average of 13.36 mgd, while maximum day demand reached 28.72 mgd with a ten-year average of 24.91 mgd. These values result in an average day to maximum day ratio of 1.86:1. The LAS District distribution system is designed to deliver anticipated maximum day demands.

Average static groundwater elevations in the District were relatively constant after the SCVWD began its recharge program. However, during the past 4 year drought period (from 2012 to 2015), the running average declined about 18 feet as shown in Figure 7, which is still significantly better than before SCVWD's recharge program. Average static water levels in 1991 were 140 feet below ground surface versus 110 feet for 2015 – a difference of 30 feet. Over the period of record, average static levels have fluctuated due to hydrologic conditions. The extended multi-year drought in the early 1990's reduced groundwater surplus water and caused a 40-foot decline in static groundwater elevation. Drought recovery began in 1992, with an increase in the average static groundwater elevation to pre-drought levels, as shown in Figure 7.

Figure 6: LAS District Well Level Average (Static)



Basin Description

Section 6.2 of the 2015 UWMP provides more information on groundwater. DWR Bulletin 118 (Appendix G in the 2015 UWMP) provides detailed information on the Santa Clara sub-basin of the Santa Clara Valley Groundwater Basin from which Cal Water's wells pump water.

Groundwater Management

Groundwater quality and quantity in the LAS District are actively managed by SCVWD in accordance with its Groundwater Management Plan (GMP), which it updates periodically. The most recent update was completed in 2012. A copy of the 2012 SCVWD Groundwater Management Plan is included in Appendix G of the LAS District 2015 UWMP.
Since the 1930s, SCVWD's water supply strategy has been to effectively manage the integrated use of surface and groundwater supplies to reliably meet water supply demands. This includes recharge of groundwater with imported and local surface supplies and through maximizing use of treated surface waters when available, acquisition of supplemental water supplies, water conservation and wastewater recycling.

Sustainable Groundwater Management Act

On September 16, 2014, Governor Brown signed into law Assembly Bill 1739, Senate Bill 1168, and Senate Bill 1319 (AB-1739, SB-1168, and SB-1319). This three-bill legislative

package is known collectively as the Sustainable Groundwater Management Act (SGMA). SGMA was amended in 2015 by Senate Bill 13, Senate Bill 226 and Assembly Bill 1390 to provide clarity to the original law and guidance on groundwater adjudications. This legislation defines sustainable groundwater management as the "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results" [Water Code § 10721(u)].
The legislation provides for financial and enforcement tools to carry out effective local sustainable groundwater management through formation of Groundwater Sustainability Agencies (GSA's) consisting of local public agencies, water companies regulated by the CPUC and mutual water companies. The legislation requires that GSA's within High and Medium Priority basins under the California Statewide Groundwater Elevation Monitoring (CASGEM) program subject to critical conditions of overdraft prepare and submit a Groundwater Sustainability Plan (GSP) for the basin by January 31, 2020 [Water Code § 10720.7(a) (1)], and requires GSA's in all other groundwater basins designated as High or Medium Priority basins to prepare and submit a GSP by January 31, 2022 [Water Code § 10720.7 (a) (2)]. Following State approval, the basin would thereafter be managed under the GSP.

Cal Water plans to work with other stakeholders in basins from which Cal Water pumps water to do what is best for sustainably managing that basin. This includes equitable sharing of costs and benefits. Cal Water recognizes the technical, legal, political, economic and financial challenges of the legislation and intends to take an active role in the local and state-wide management of groundwater resources over the next 25+ years. Specific steps that the Company intends to take include (among others):

- Outreach to public agencies to ensure that Cal Water's presence, rights and interests, historical and current resource concerns are incorporated within the GSA and GSP formulation processes;

- Outreach to local and regulatory agencies to ensure Cal Water's participation in meeting requirements and expectations set forth by SGMA;

- Enhanced use of digital/electronic groundwater monitoring equipment and other new technology for measuring withdrawal rates, pumping water levels, and key water quality parameters within the context of day-to-day operations;

- Full participation in the development of GSP's and formulation of groundwater models being constructed in basins from which groundwater is pumped;

- Full participation in individual and/or joint projects aimed at mitigating seawater intrusion, overdrafting and other problems;

- Including groundwater management principles and data in all applicable technical reports, studies, facility master plans, and urban water management plans (including the 2015 UWMP update), particularly as these undertakings relate or pertain to water resource adequacy and reliability;

- Including groundwater management principles and data in all general rate case (GRC) filings and grant applications to ensure that resource management objectives remain visible and central to Cal Water's long-term planning/budgeting efforts;

UWMPs prepared by Cal Water over the past decade, including 2015, contain many of the elements required by SGMA and thus will be useful for implementation of SGMA and the basin GSP.

Table 9 shows the volumes pumped by Cal Water from the sub-basin over the past 5 years.

Table 9: LAS District Groundwater Pumped (AF)

Basin Type	Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Santa Clara Sub-basin	2,881	4,266	4,990	6,240	3,341
Total		2,881	4,266	4,990	6,240	3,341

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LAS District Capital Improvements Program

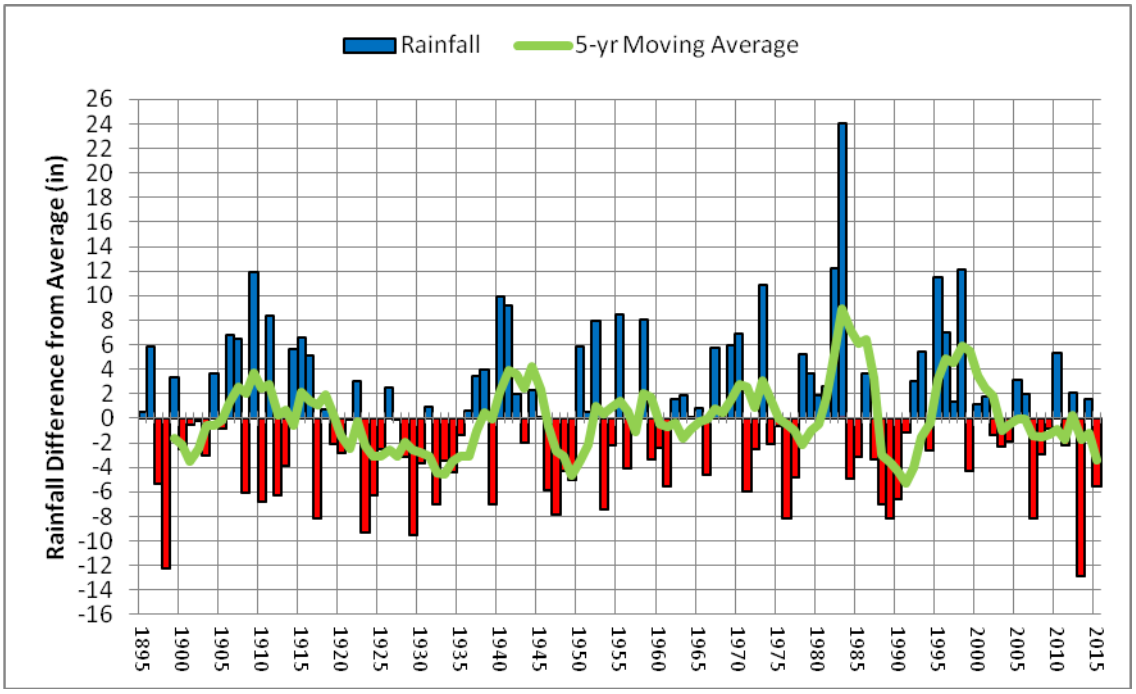
Cal Water has an ongoing capital improvements program for the LAS District. It assesses the operational condition and useful life of all of its wells, their production output and water quality to ensure compliance with state drinking water standards. The program includes repair, rehabilitation, replacement and development of new wells in order to ensure a reliable production capacity to meet 100% of average annual daily demand with sufficient reserve production capacity in the event several large production wells are non-operational for maintenance or other reasons. Capital improvements projects for a three year period are submitted to the CPUC for review and approval. In its general office in San Jose, Cal Water has a large multi-disciplinary engineering department and water quality department that works with the LAS District staff in implementing projects and ensuring their operational readiness on a timely basis.

Supply Adequacy and Reliability Assessment

This section summarizes previously presented information on projected demand and supplies for the LAS District to address the question of whether its supplies are adequate and reliable for the next 20 years for normal hydrologic conditions, one dry year and a multiple dry year period. Note that supply always equals demand due to the fact that Cal Water varies its groundwater production in response to the availability of SCVWD purchased water.

Figure 7 compares annual rainfall from 1985 to 2015 (30 years) to the historic average (16.44 inches). A normal hydrologic year occurred in 1927 when precipitation was approximately 0.2 percent below the historic average for the period from 1903 to 2015.

Figure 7: LAS District Annual Rainfall



SOURCE: PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, created Feb 2016

The single-dry and multi-dry base years for drought planning shown in Table 10 are based on the designations of SCVWD.

Table 10: LAS District Basis of Water Year Data (AF)

Year Type	Base Year	Available supplies	
		Available	% of avg supply
Average Year	1927	14,872	100%
Single-Dry Year	1977	14,872	100%
Multiple-Dry Years 1st Year	2013	13,015	87.5%
Multiple-Dry Years 2nd Year	2014	9,660	65%
Multiple-Dry Years 3rd Year	2015	11,735	76.5%

Historically, Non-Contract water has supplied a large portion of the LAS District total supply requirements. However, this source is not considered a normally available supply. Non-Contract water deliveries have a five year average of 3,368 AF, which is 22 percent of the total supply to the Los Altos District for this period. Non-Contract water will be the first source of

supply to be eliminated and acts as a buffer for a single dry year or multi-year drought. During multiple dry years, decreased purchased water is made up by pumping stored groundwater.

According to SCVWD's UWMP, if reductions in SWP and CVP deliveries occur due to drought events, the diversion of water to percolation ponds will be curtailed first, followed by agricultural deliveries, and finally urban water deliveries. When this happens an increased reliance will be put on production from stored groundwater, which increases during years of surplus surface water deliveries. Because of this policy, SCVWD anticipates that it will be able to meet its retail urban water demands by shifting supply sources even during multiple dry year periods.

Tables 11, 12, and 13 are reproduced from the SCVWD May 17. 2016 update of their 2015 UWMP, and show respectively the average, single-dry, and multi-dry year available supplies, demands, and surpluses or shortages. The tables include all supplies available to the LAS District, including groundwater, which is managed by SCVWD. The LAS District assumes that its future supplies will be subject to the same percentage shortages as shown in Tables 12 and 13. Should shortages occur, Cal Water would more aggressively implement its demand management programs and requirements.

Table 11: SCVWD Average Supplies and Demands (AF)

Supplies	2020	2025	2030	2035	2040
Natural Groundwater Recharge	60,900	60,900	60,900	60,900	61,000
Local Surface Water	78,600	85,600	89,700	92,400	93,400
Recycled Water	23,300	28,500	31,900	33,100	33,500
Potable Reuse	-	20,200	20,200	20,200	20,200
San Francisco Public Utilities Commission	56,400	57,600	57,800	58,000	58,500
CVP and SWP Allocations	171,000	175,300	175,300	175,300	175,300
Sum	390,200	428,100	435,800	439,900	441,900
Demands	371,200	391,300	408,600	425,800	435,100
Difference	19,000	36,800	27,200	14,100	6,800
Percent Shortage	--	--	--	--	--

Table 12: SCVWD Single Dry Year Supplies and Demands (AF)					
Supplies	2020	2025	2030	2035	2040
Natural Groundwater Recharge	47,500	47,500	47,500	47,500	47,500
Local Surface Water	6,000	16,600	18,600	19,100	19,000
Recycled Water	23,300	28,500	31,900	33,100	33,500
Potable Reuse	-	20,200	20,200	20,200	20,200
San Francisco Public Utilities Commission	55,900	57,100	57,200	57,500	57,900
CVP and SWP Allocations	73,600	73,600	73,600	73,600	73,600
Transfers	6,000	12,000	12,000	12,000	12,000
Reserves	158,300	135,400	147,000	162,100	144,800
Supply Total	**370,700**	**390,800**	**407,900**	**425,000**	**408,500**
Demands	**370,600**	**390,800**	**407,900**	**425,000**	**434,300**
Difference	**0**	**0**	**0**	**0**	**-25,800**
Percent Shortage	**--**	**--**	**--**	**--**	**6%**

Table 13: SCVWD Multiple Dry Year Supplies and Demands (AF)						
		2020	2025	2030	2035	2040
First Year (2013)	Supply Totals	370,800	391,000	408,200	425,200	434,700
	Demand Totals	370,800	391,000	408,200	425,200	434,700
	Difference	--	--	--	--	--
	Percent Shortage	--	--	--	--	--
Second Year (2014)	Supply Totals[1]	330,900	389,300	377,600	363,200	354,900
	Demand Totals	370,600	390,900	407,900	424,800	434,300
	Difference	**-39,700**	**-1,600**	**-30,300**	**-61,600**	**-79,400**
	Percent Shortage	**11%**	**0%**	**7%**	**15%**	**18%**
Third Year (2015)	Supply Totals[1]	257,500	331,200	307,200	275,800	256,800
	Demand Totals	370,500	390,700	407,800	424,700	434,100
	Difference	**-113,000**	**-59,500**	**-100,600**	**-148,900**	**-177,300**
	Percent Shortage	**30%**	**15%**	**25%**	**35%**	**41%**

SCVWD notes that supply totals in Tables 12 and 13 are based on its current supply and infrastructure and that:

"The District plans to update its Water Master Plan in 2017. As part of the planning process, the District will evaluate supply projects and programs to minimize the need to call for water use reductions greater than 10 percent."

Normal Hydrologic Year

In normal hydrologic years, Non-Contract water is expected to be available. Cal Water also expects increases in approved SCVWD deliveries will eventually reduce availability of Non-Contract water. According to the SCVWD 2012 WIP, LAS District projected water scheduled delivery amounts will be available through at least 2035.

As previously indicated, the LAS district has historically pumped only a fraction of its total annualized well capacity, leaving the balance in groundwater storage. Because of this banking practice, there is an adequate supply of stored groundwater in the aquifers supplying LAS district wells.

As shown in Table 14, projected supplies are adequate to 2040.

Table 14: LAS District Normal Year Supply and Demand Comparison (AF)

	2010	2015	2020	2025	2030	2035	2040
Supply	11,648	10,188	14,336	14,518	14,795	14,957	15,150
Demand	11,648	10,188	14,336	14,518	14,795	14,957	15,150
Difference	0	0	0	0	0	0	0

Single Dry Year

For a single dry year, Cal Water expects a reduction in Non-Contract water but not in firm scheduled deliveries. Pumping restrictions in the Delta could have a greater impact on imported supplies during a single dry year. But if any reduction in scheduled deliveries occurs, the needed supply would come from pumping stored groundwater.

SCVWD maintains carryover storage in its reservoirs, locally stored groundwater reserves, and has access of up to 50,000 AFY of drought supplies stored as groundwater in the Semitropic Groundwater Bank. Although SCVWD's 2010 UWMP indicates a 5 percent shortfall in treated water contract deliveries in 2020 and 2025, SCVWD in 2015 is accelerating its schedule for increasing production capacity of its SVAWPC plant to 32 mgd by 2020. Therefore, with implementation of this plant and other supply projects described in SCVWD's Water Master Plan, it is assumed that there will be sufficient additional supplies so that all urban contract deliveries can be met during single dry years. Recycled water deliveries are not expected to be affected by a single dry year. If purchased water deliveries are reduced, groundwater pumped from Cal Water wells will provide the necessary supply to meet single dry year demand.

As shown in Table 15, LAS District projects that it will have adequate supplies to meet demand for a single-dry year.

Table 15: Las District Single Dry Year Supply and Demand Comparison (AF)					
	2020	2025	2030	2035	2040
Supply	15,275	15,312	14,795	14,957	15,150
Demand	14,336	14,518	14,795	14,957	15,150
Difference	0	0	0	0	0

Multiple Dry Year Period

SCVWD gives highest priority to delivery of Contract water to urban water retailers and indicates it will be deliver 100% of its contracted supply obligations even during multiple dry year periods after additional supply projects are implemented in 2025. During drought periods, SCVWD will eliminate deliveries of Non-Contract water. If drought conditions are severe enough, SCVWD will reduce or eliminate surface water recharging to aquifers within its service area. If further reductions are necessary, deliveries to agricultural customers will be reduced or eliminated. Deliveries to SCVWD urban water retailers are the last to be affected by drought conditions. Based on SCVWD supplies, policies and plans, Cal Water expects that pending the completion of new supply projects, Contract water may be reduced to the LAS District during a multiple dry year period as shown in Table 16. Because LAS District wells cannot pump more groundwater than authorized by SCVWD, demand reductions will need to be implemented to meet the available total supply. The magnitude of reductions required will depend on the degree and duration of the drought. SCVWD considers its groundwater and imported supplies as one source and does not distinguish between water sources when asking for demand reductions from its retail utilities.

Supply in Table 16 is based on Table 13, which shows potentially significant future SCVWD supply reductions. If no demand reduction actions are taken by Cal Water, supplies would be insufficient. However, it is assumed in the WSA that in the 2nd year projected demand can be decreased by up to 22% (year 2040) and in the 3rd year it can be decreased by up to 36% (year 2040). Therefore, while there would be SCVWD supply shortages, Cal Water would be proactive and implement demand reduction measures and programs when SCVWD began projecting reduced supplies. As demonstrated by 2015 demand data, the LAS District achieved reductions beyond the state mandated 32%. Cal Water believes that it can achieve similar reductions if required to match SCVWD drought induced reductions in supplies.

Table 16: LAS District Multiple Dry Years Supply and Demand Comparison (AF)						
		2020	2025	2030	2035	2040
First year	Supply totals	14,336	14,518	14,795	14,957	15,150
	Demand totals	14,336	14,518	14,795	14,957	15,150
	Difference	0	0	0	0	0
Second year	Supply totals	12,450	13,941	13,062	12,185	11,792
	Demand totals	12,450	13,941	13,062	12,185	11,792
	Difference	0	0	0	0	0
Third year	Supply totals	10,691	12,884	11,648	10,274	9,563
	Demand totals	10,691	12,884	11,648	10,274	9,563
	Difference	0	0	0	0	0

Cal Water expects that its LAS District customers will be able to achieve requested reductions in water use. In the LAS District, total annual water use per customer is expected to be lower than in previous dry year periods due to the greater investment in water conservation programs that have been and continue to be implemented. As demonstrated in 2015, the most recent drought year, the response by Cal Water customers in reducing water use was significantly greater than anticipated based on past droughts due to improved water conservation plans, more effective communications on the need to reduce water use and a statewide directive for urban water use reduction from the Governor.

Climate Change

Cal Water prepared a Climate Assessment Report in 2013 that evaluates potential effects of climate change on the water supplies of its 24 service areas in California. The report identifies adaptation measures that Cal Water may take to address potential decreases in supply quantities or negative changes in source water quality. DWR's *Guidebook to Assist Water Suppliers to Prepare a 2010 Urban Water Management Plan,* lists topics examined in Cal Water's Climate Assessment Report.

Adaptation measures are essentially designed to ensure that projected future supplies are reliable despite adverse changes in existing supply quantity and quality due to climate change. For example, snow in the Sierra Nevada provides 65 percent of California's water supply. Some predictions are that by 2050 the annual Sierra Nevada snow pack will be significantly reduced. Much of the lost snow will be in the form of rain, which will run off during winter and early spring and not be available to be stored as supplies for use during summer. Change in water runoff may significantly reduce groundwater recharge in the Central Valley increasing demands on surface water.

DWR continues to work on identifying potential climate change effects on water supplies, water demand, sea level, and occurrence and severity of weather events. Some potential changes are summarized below:

- Water demand: more hot days and nights and a longer irrigation season will increase agricultural and urban irrigation needs; power plants and industrial processes will have increased cooling water needs.
- Water supply and quality: increased potential for algal bloom and surface and groundwater chemistry changes; increased potential for seawater intrusion into surface and groundwaters due to elevated seawater levels and more powerful storm surges.
- Extreme weather events are expected to become more frequent as climate variability increases, resulting in a higher frequency of more extreme droughts and floods.

SUMMARY AND CONCLUSION

Based on:

- Existing and planned supplies from SCVWD and LAS District groundwater,
- Cal Water's ongoing capital improvements program to maintain existing groundwater production capacity and construct new wells to increase well production capacity,
- Existing Agreements and plans to continue to purchase SCVWD Non-Contract water whenever it is made available and increase basin groundwater storage for use during drought periods,
- In-place, ongoing and planned expanded water conservation programs and best management practices for reducing existing demand during normal hydrologic years, single dry year and multiple dry years in compliance with SBx7-7, CPUC and MOU requirements,
- More stringent water conservation requirements for new developments, which will result in lower water use rates than for comparable existing services,
- Cal Water's historic proven success in obtaining significant reductions in water use during multiple dry years by implementing its demand reduction program, and
- Over 90 years of experience in continuously providing an adequate supply to meet demands during normal, single and multiple dry years in the LAS District,

Cal Water concludes that for the 20 years from 2020 to 2040, the LAS District will have sufficient water supplies to meet the projected demands of the proposed Vallco ASP, those of other development summarized in this WSA and all existing and future projected customers for normal, single dry year and multiple dry year conditions.

End of WSA

REFERENCES

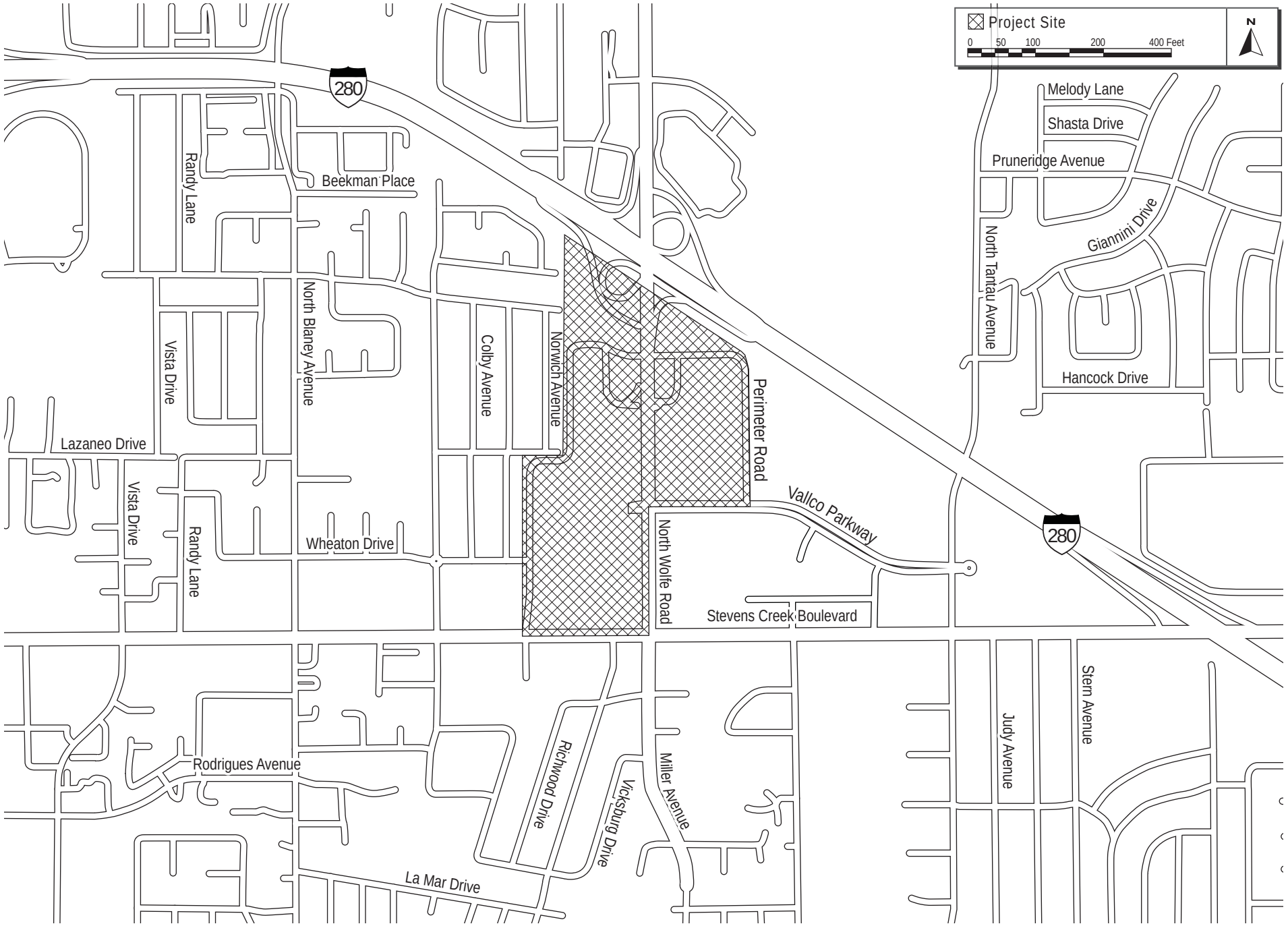
1. California Water Service Company "Urban Water Management Plan LAS District" Adopted June 2016, 949 B Street, Los Altos, CA 94024 https://www.calwater.com/conservation/uwmp/rd/

2. California Water Service Company "Urban Water Management Plan LAS District" Adopted June 2011, 949 B Street, Los Altos, CA 94024 https://www.calwater.com/conservation/uwmp/rd/

3. Santa Clara Valley Water District "2012 Water Supply and Infrastructure Master Plan" October 2012

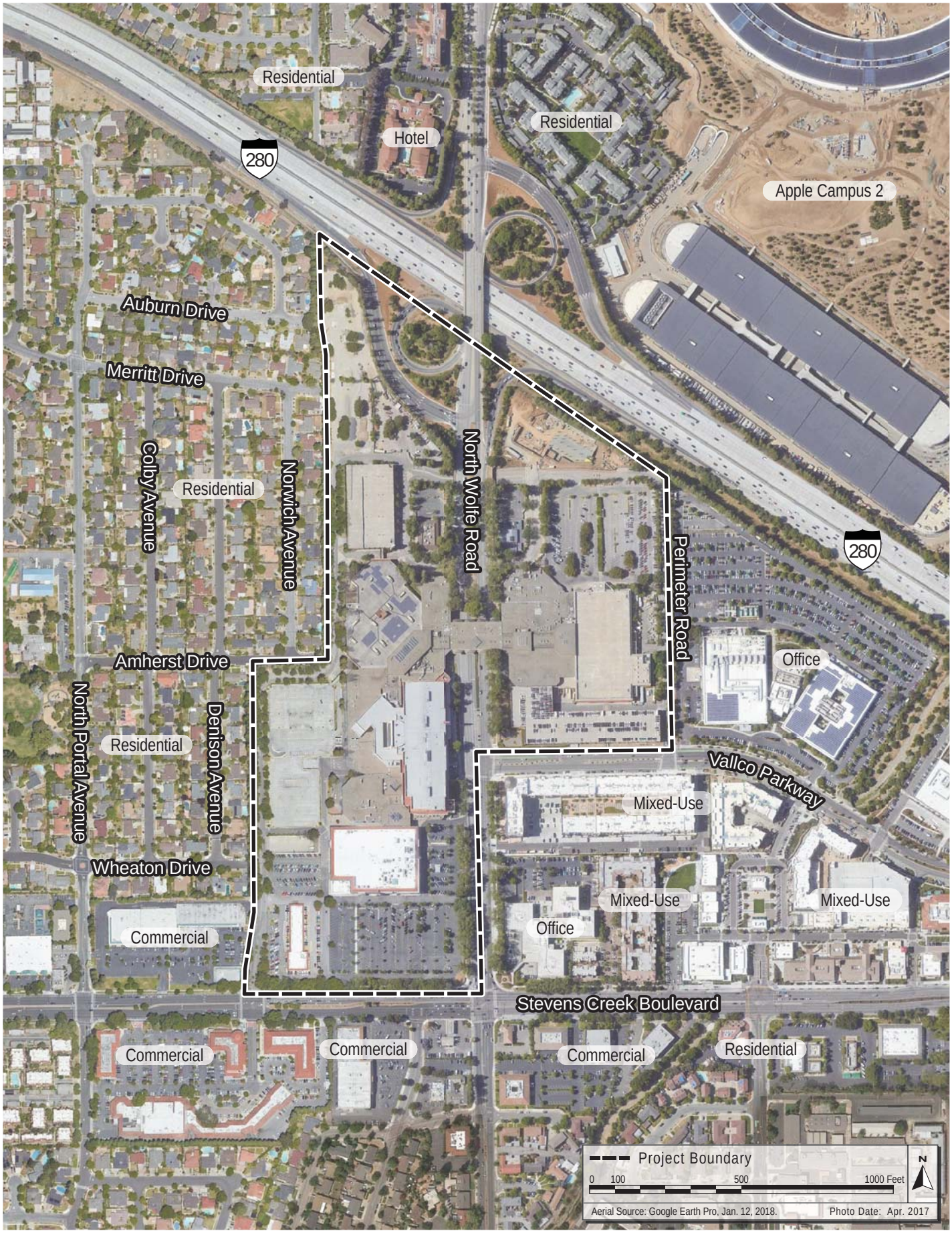
4. Santa Clara Valley Water District "Wolfe Road Facilities Planning Study Report" December 2014

ATTACHED FIGURES



VICINITY MAP

FIGURE 2



AERIAL PHOTOGRAPH WITH SURROUNDING LAND USES FIGURE 3