

# Appendix H1

## **Water Supply Assessment**





## WATER SUPPLY ASSESSMENT

# DOWNTOWN WEST MIXED-USE PROJECT (GOOGLE PROJECT)

January 2020

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San Jose Water (SJW) is one of the largest privately owned water systems in the United States, providing high-quality water and exceptional service to more than one million residents of Santa Clara County since established in 1866.

## BACKGROUND & PURPOSE

This Water Supply Assessment (WSA) was requested by the City of San Jose and is associated with the proposed Downtown West Mixed-Use Project (Google Project). The Google Project would allow for the demolition of existing buildings and a phased development of up to 7.3 million gross square feet (gsf) of commercial office space; up to 5,900 dwelling units; up to 500,000 gsf of “active uses” (commercial retail/restaurant, arts, cultural, institutional, education, nonprofit, small-format office space) of which approximately 62,000 gsf of existing space may be retained, but would be repurposed; up to 300 hotel rooms; up to 800 rooms of limited-term corporate accommodations (akin to a suites hotel not open to the public); 100,000 gsf for an event and conference space; a 100,000 gsf logistics warehouse; about 16.8 acres of open space; and up to two central utility plants.

The Google Project site (Figures 1 – 3) is generally bounded by Lenzen Avenue and the Union Pacific Railroad tracks to the north; North Montgomery Street, Los Gatos Creek, the Guadalupe River, South Almaden Street, and Royal Avenue to the east; Auzerais Avenue to the south; and Sunol Avenue, Diridon Station, and the Caltrain rail line to the west. The project also includes the area bounded by Los Gatos Creek to the west, San Fernando Street to the south, the Guadalupe River to the east, and Santa Clara Street to the north.

This WSA describes the relationship between existing and future water supplies and presents SJW’s strong ability to provide a diverse water supply to match build-out water demands under both normal and dry years. This diverse supply consists of local surface water from SJW’s Santa Cruz Mountain sources, groundwater, treated surface water from Valley Water’s local and imported supplies, and non-potable recycled water. Based on water supply projections reported in Valley Water’s 2015 Urban Water Management Plan,<sup>1</sup> conservation methods currently employed, and on SJW’s active commitment to these methods, SJW is able to meet the needs of the service area through at least 2035 for average and single-dry years without a call for mandatory water use reductions.<sup>2</sup> This assumes reserves are at healthy levels at the beginning of the year and that projects and programs identified in Valley Water’s Water Supply Master Plan 2040 (WSMP 2040)<sup>3</sup> are implemented. If reserves are low at the beginning of a single-dry year, Valley Water might call for water use reductions in combination with using reserves.

Valley Water is evaluating water supply projects and programs to minimize the need to call for water use reductions to mitigate water shortages that would otherwise occur in the event of a multiple-dry year scenario. SJW is committed to actively working with Valley Water in the development of these projects and programs. Projects and programs may include additional long-term water conservation savings, water recycling, recharge capacity, storm water capture, reuse, banking, and storage.

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<sup>1</sup> <https://www.valleywater.org/your-water/water-supply-planning/urban-water-management-plan>

<sup>2</sup> San Jose Water 2015 Urban Water Management Plan.

<sup>3</sup> <https://www.valleywater.org/your-water/water-supply-planning/water-supply-master-plan>

This WSA is written in response to California Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221); legislation which requires water retailers to demonstrate whether their water supplies are sufficient for certain proposed subdivisions and large development projects subject to the California Environmental Quality Act. SB 610 includes the requirements for detailed water supply assessments, and SB 221 includes the requirement for written verification of sufficient water supply based on substantial evidence. SB 610 requires that a WSA be prepared by the local water retailer and submitted within 90 days to the requesting agency. SJW’s adoption and submittal of this assessment does not create a right or entitlement to water service or impose or expand SJW’s obligation to provide water service. The City of San Jose has an independent obligation to assess the sufficiency of water supply for the Google Project. SB 610 provides that the City of San Jose is to determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the Google Project, in addition to existing and planned future uses.

## SERVICE AREA & POPULATION

SJW’s service area spans 139 square miles, including most of the cities of San Jose and Cupertino, the entire cities of Campbell, Monte Sereno, Saratoga, the Town of Los Gatos, and parts of unincorporated Santa Clara County.

The population of SJW’s service area, including growth associated with this Plan Area, is shown in the following table. These projections are based on the Association of Bay Area Governments’ population projections and were included in SJW’s 2015 Urban Water Management Plan.

**Table 1: Current and Projected SJW Service Area Population**

2015	2020	2025	2030	2035	2040
982,750	1,034,396	1,087,273	1,142,484	1,201,289	1,262,356

## CLIMATE

The San Jose area experiences a low-humidity moderate climate with an annual average rainfall total of about 14 inches. Maximum monthly average temperatures range from the mid 60’s to the low 80’s (°F) in spring and summer and from the high 50’s to low 60’s (°F) in the winter.<sup>4</sup> Most precipitation in the area occurs between November and March with January and February typically being the wettest months as shown in Table 2. According to Valley Water’s 2015 UWMP, the annual average evapotranspiration rate for the San Jose area is about 50 inches per year. Evapotranspiration measures the loss of water to the atmosphere by evaporation from soil and plant surfaces and transpiration from plants. Evapotranspiration serves as an indicator of how much water plants need for healthy growth.

<sup>4</sup> Monthly temperature totals from [www.weather.com](http://www.weather.com)

**Table 2: Climate Data**

	Jan	Feb	Mar	Apr	May	Jun
<b>Average High Temperature (°F)</b>	58	62	66	69	74	79
<b>Average Low Temperature (°F)</b>	42	45	47	49	52	56
<b>Average Precipitation (in)</b>	2.8	2.6	2.3	1.1	0.4	0.1
<b>Evapotranspiration (in)</b>	1.5	1.9	3.5	5.0	6.0	6.8

	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Average High Temperature (°F)</b>	82	82	80	74	64	58	70.7
<b>Average Low Temperature (°F)</b>	58	58	57	53	46	42	50.4
<b>Average Precipitation (in)</b>	0.0	0.0	0.2	0.7	1.5	2.5	14.3
<b>Evapotranspiration (in)</b>	7.0	6.3	4.8	3.5	1.9	1.4	49.6

## PAST, CURRENT AND FUTURE SYSTEM WATER USE

The majority of connections to SJW’s distribution system are either residential or commercial. SJW also provides water to industrial, institutional, and governmental connections. SJW’s customer database does not differentiate between single-family and multi-family residential accounts, but estimates 15 percent of all residential accounts are multi-family. The resale category represents the small mutual water companies, in which SJW provides a master water service and where the mutual water company is responsible for distributing the water.

SJW has developed demand projections from 2015 to 2040 based on population and per capita usage projections. The Association of Bay Area Governments (ABAG) census tract population projections were used to estimate population growth. It was assumed that population growth after 2010 would be within new, high water efficiency developments with a demand of 100 gpcd. It is expected that on average the per capita usage for the existing 2010 population will experience an annual decline of 0.2 percent until 2040.

**Table 3: SJW Water Use by Customer Type (AF/yr)**

Customer Type	2015	2020	2025	2030	2035	2040
<b>Single Family</b>	47,789	63,443	65,536	67,752	70,155	72,677
<b>Multi Family</b>	8,433	11,195	11,567	11,956	12,380	12,825
<b>Commercial</b>	36,434	48,369	49,965	51,652	53,485	55,409
<b>Industrial</b>	700	930	961	991	1,028	1,065
<b>Institutional / Governmental</b>	4,984	6,617	6,834	7,065	7,316	7,580
<b>Sales / Transfers / Exchanges</b>	408	543	559	580	598	620
<b>Other</b>	150	199	206	212	221	230
<b>Total</b>	98,898	131,296	135,626	140,208	145,183	150,406

SJW’s total demand is not limited to metered usage. Non-revenue water is the sum of (a) water losses, (b) unbilled metered consumption, and (c) unbilled unmetered consumption.

- (a) Water losses are separated into two categories: apparent losses and real losses. Apparent losses include all types of inaccuracies associated with customer metering, theft, as well as data handling errors. Real losses are physical water losses from the pressurized system and the utility’s storage tanks, up to the customer meter. For example, this might include lost water through leaks, breaks and overflows.
- (b) Unbilled metered consumption might include metered consumption by the utility.
- (c) Unbilled unmetered consumption is any kind of authorized consumption, which is neither billed nor metered. This typically includes items such as firefighting, flushing mains, and draining water storage facilities.

Over the last ten years (2009 – 2018) SJW averaged less than seven percent non-revenue water as a percent by volume of water supplied, based on the American Water Works Association (AWWA) Water Audit Software. This consistently low level of non-revenue water indicates SJW has an efficient, well-maintained water system. SJW is committed to continuing to reduce its non-revenue water loss percentages through investments in acoustic leak correlation and logging equipment, advanced metering infrastructure, as well as a prudent water main replacement program that ranks pipelines for replacement primarily based upon their propensity to leak.

**Table 4: SJW Total System Demand (AF/yr)**

	2015	2020	2025	2030	2035	2040
<b>Customer Metered Demand</b>	98,898	131,296	135,626	140,208	145,183	150,406
<b>Non-Revenue Water</b>	7,553	9,139	9,440	9,759	10,106	10,471
<b>Total System Demand</b>	106,451	140,435	145,066	149,967	155,289	160,877

## ESTIMATED PROJECT WATER USE

Total estimated water usage for the Google Project at buildout is 2,971,100 gallons per day (gpd), which is equivalent to about 3,328 acre-feet per year (AF/yr) of water. However, the area being developed as part of the Google Project has existing water usage, which is on average 33,690 gpd or about 38 AF/yr and will be eliminated. The project sponsor may retain about 62,000 gsf of existing small-scale industrial structures on and near South Autumn Street. However, those structures would be repurposed with new uses as part of the proposed project and therefore the existing water demand was considered eliminated and the forecasted water demand at buildout for that retained space was considered new water demand.

The net demand increase in water usage associated with the Google Project is really about 3,290 AF/yr, which represents a 2.2% increase over the system wide 2013 water production of 146,776 AF.



**Table 5: Total Water Demand Estimated for Project**

Land Use Name	Proposed Project	Water Demand Factor (gpd per unit)	Water Usage
Existing Structures <sup>1</sup>	-	-	33,690 gpd
Residential <sup>2</sup>	5,900 homes	320	1,888,000 gpd
Active Uses (Retail, Restaurant, Arts, Cultural, Institutional, Education, Nonprofit, Small-Format Office)	500,000 gsf	0.25	150,000 gpd
Hotel	300 rooms	100	30,000 gpd
Limited-term Corporate Accommodation	800 rooms	100	80,000 gpd
Office	7.3 million gsf	0.1	730,000 gpd
Event/Conference Center	100,000 gsf	0.25	25,000 gpd
Utilities Plants	115,000 gsf	0.5	57,500 gpd
Logistics/Warehouse	100,000 gsf	0.02	2,000 gpd
Open space and setbacks	16.8 acres	2000	33,600 gpd
		<b>Net Demand</b>	<b>2,937,410 gpd</b>
		<b>Net Demand</b>	<b>3,290 AF/yr</b>

<sup>1</sup> Existing daily demand based on pre-drought 2013 calendar year usage

<sup>2</sup> Based on a demand factor of 100 gallons per capita per day for all new residents, 3.2 people per residential unit based on 2019 population estimates from the California Department of Finance

## SYSTEM SUPPLIES

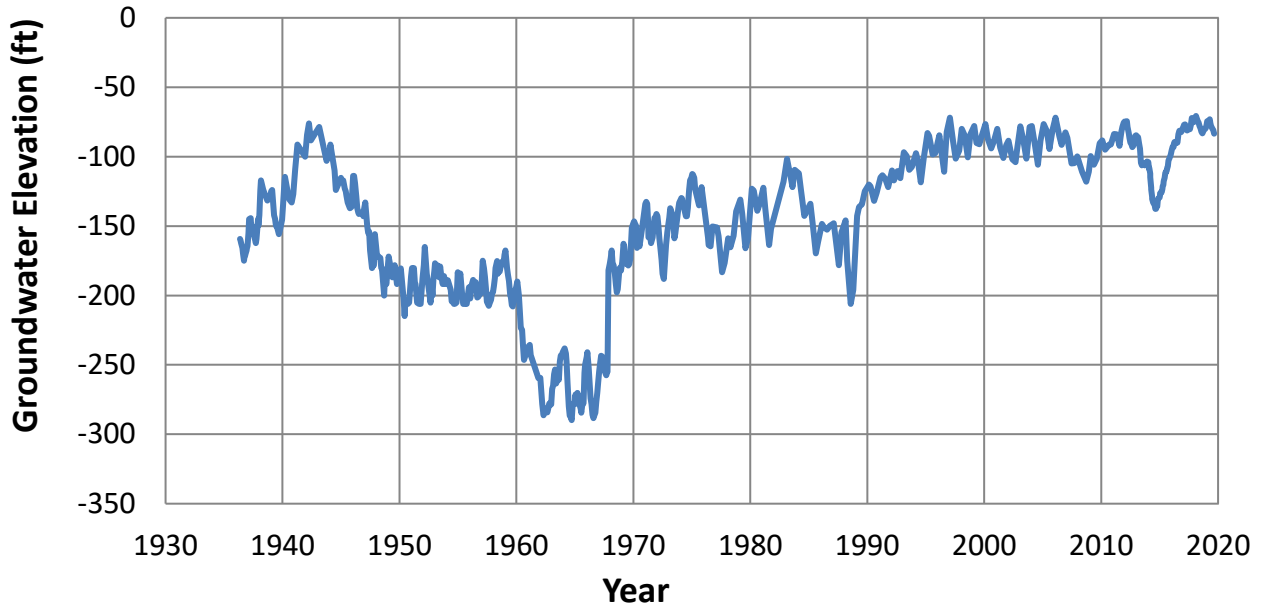
This section describes and quantifies the current and projected sources of water available to SJW. A description and quantification of recycled water supplies is also included.

**Imported Treated Surface Water** – In 1981, SJW entered into a 70-year master contract with Valley Water for the purchase of treated water. The contract provides for rolling three-year purchase schedules establishing fixed quantities of treated water to be purchased during each period. Water is treated at one of three Valley Water -operated treatment plants (Rinconada, Penitencia and Santa Teresa). SJW and Valley Water currently have a three-year treated water contract for fiscal years 2017/2018 – 2019/2020, with an annual contract supply of 68,114 AF/yr.

**Groundwater** – SJW draws water from the Santa Clara Valley Subbasin (basin) in the north part of Santa Clara County. The basin is 22 miles long and 15 miles wide, with a surface area of 225 square miles and an operational storage capacity estimated to be 350,000 AF.

The following chart shows groundwater elevation in the basin since the mid 1930's using the well surface elevation as the datum. In 2012, the groundwater basin level was high and well prepared for the effects of a multi-year drought. The high groundwater levels were a result of less pumping, an increased use of imported water, and recharge of water into the aquifer by Valley Water. During the recent drought, which officially ended in the State of California on April 7, 2017, SJW relied more heavily on groundwater, which caused the groundwater elevation to decline. However, as can be seen

in Chart 1 below, the groundwater elevation has since rebounded and storage in the basin is now in the normal range.



*Chart 1: Groundwater Elevation in Santa Clara Valley Subbasin (Well ID: 07S01W25L001)*

Groundwater from the basin is a substantial source of water for SJW and in 2014 groundwater accounted for about 57% of SJW’s total potable supply. The following table shows the groundwater SJW pumped from the basin from 2011 to 2015.

**Table 6: Amount of Groundwater Pumped by SJW (AF/yr)**

Basin Name	Metered or Unmetered	2011	2012	2013	2014	2015
Santa Clara Valley Subbasin	Volumetric meter data	38,500	39,696	57,707	74,552	37,888
Groundwater as a percent of total potable water supply		28.3%	28.2%	39.3%	56.8%	35.8%

**Surface Water** – SJW has “pre-1914 surface water rights” to raw water in Los Gatos Creek and local watersheds in the Santa Cruz Mountains. Prior to 1872, appropriative water rights could be acquired by simply taking and beneficially using water. In 1914, the Water Code was adopted and it grandfathered in all existing water entitlements to license holders. SJW filed for a license in 1947 and was granted license number 10933 in 1976 by the State Water Resources Control Board to draw 6,240 AF/yr from Los Gatos Creek. SJW has upgraded the collection and treatment system that draws water from this watershed which has increased the capacity of this entitlement to approximately 11,200 AF/yr for an average rain year.

Montevina Surface Water Treatment Plant (Plant) is the primary supply source for Town of Los Gatos, and the surrounding communities. The Plant uses microfiltration membrane technology and is capable of treating up to 30 million gallons of water per day.

**Recycled Water** – South Bay Water Recycling (SBWR) has been serving Silicon Valley communities since 1993 with a sustainable, high-quality water supply. SBWR was created to reduce the environmental impact of freshwater effluent discharge into the salt marshes located at the south end of the San Francisco Bay, and to help protect the California clapper rail and the salt marsh harvest mouse.

In 1997, SJW entered into a Wholesaler-Retailer Agreement with the City of San Jose to provide recycled water to SJW’s existing and new customers nearby SBWR recycled water distribution facilities; whereas, the City of San Jose is the wholesaler and SJW is the retailer. At the time, the involvement of SJW was largely to assist the City in meeting its wastewater regulatory obligations. In accordance with the terms of this agreement, SJW allowed SBWR to construct recycled water pipelines in its service area, SJW would only own the recycled water meters, while SBWR would own, operate, and maintain the recycled water distribution system.

In 2010, this Wholesaler-Retailer Agreement was amended to allow SJW to construct recycled water infrastructure that would be owned, operated, and maintained by SJW. Then in 2012, this Wholesaler-Retailer Agreement was again amended to allow SJW to construct additional recycled water infrastructure.

**Summary of Existing and Planned Sources of Water** – SJW and Valley Water have worked to develop a variety of local and imported water supplies to meet demands. As demands increase with the region’s growth, and imported water supplies potentially become more restricted, these planned supplies will increase in importance. In particular, groundwater, which has historically been a vital source of supply for SJW, was all the more critical during the recent drought. The following table shows the actual amount of water supplied to SJW’s distribution system from each source in 2015 as well as projected amounts until 2040.

**Table 7: Current and Projected Water Supplies<sup>1</sup> (AF/yr)**

	2015	2020	2025	2030	2035	2040
<b>Valley Water Treated Water</b>	63,796	76,670	79,383	82,255	85,376	88,651
<b>SJW Groundwater</b>	37,888	54,160	56,078	58,106	60,307	62,621
<b>SJW Surface Water</b>	4,766	9,606	9,606	9,606	9,606	9,606
<b>Recycled Water</b>	1,964	4,072	6,853	8,350	8,369	8,369
<b>Total System Demand</b>	108,415	144,508	151,919	158,318	163,658	169,246

<sup>1</sup>Projected potable water supply volumes based on a 10-year average (2006-2015) of usage by type and holding surface water constant @ 10-year average.

## WATER SUPPLY VULNERABILITY

SJW has identified multiple sources of water for the Google Project, which would provide a high quality, diverse and redundant source of supply. For added backup, SJW incorporates diesel-fueled generators into its facilities system, which will operate wells and pumps in the event of power outages. Since Valley Water influences over 90% of SJW’s annual water supply, SJW will continue to work with Valley Water to ensure water supply for the Google Project is reliable, while the impact to the existing Santa Clara Valley Subbasin is minimal.

Valley Water recommends in their 2003 Integrated Water Resources Planning Study that water supply sources be maintained at 95% reliability during significant water shortages that occur during multiyear droughts. To accomplish this, SJW can use less groundwater in certain areas or zones to achieve the overall balance, which best meets the operational goals of Valley Water and SJW.

## TRANSFER AND EXCHANGE OPPORTUNITIES

SJW’s distribution system has interties with the following retailers in the San Jose area: City of Santa Clara, City of San Jose Municipal Water, City of Milpitas, and Great Oaks Water. SJW currently has no plans to use these interties for normal system operation as they are exclusively used for potential emergency sources.

## WATER SUPPLY RELIABILITY

To assess water supply reliability it is critical to first identify constraints on water sources and compare total projected water use with expected water supply.

**Constraints on Water Sources** – SJW has three sources of potable water supply: groundwater, imported treated surface water and local surface water. These three sources of supply are constrained in one or more ways, driven by legal, environmental, water quality, climatic, and mechanical conditions. Additionally, there is a potential for interruption of supply caused by catastrophic events.

**Table 8: Factors Resulting in Supply Inconsistency**

Supply	Legal	Environmental	Water Quality	Climatic	Mechanical
Local Surface		x	x	x	x
Groundwater		x	x	x	x
Imported Treated Surface Water	x	x	x	x	x

*Legal* - Valley Water is responsible for managing water resources in Santa Clara County, including the long-range planning for additional supplies and/or conservation needed to meet future water demands. SJW and other retailers work closely with Valley Water to coordinate the purchase of treated imported water and the extraction of groundwater from retailer-owned wells. This activity is important to the operation of the countywide water supply and distribution system and the retailers are dependent on Valley Water’s long-range resource planning.

In determining the long-range availability of water, considerations must also be given to decisions at the state or federal level that are out of the Valley Water's control. Valley Water has contracts for water deliveries with both the State Water Project (SWP) and the Federal Central Valley Project (CVP). Due to flow restrictions for the protection of water quality and the habitat of fish and wildlife in the Delta, water deliveries may be reduced from previous levels. During critical dry periods the Valley Water can expect additional reductions in water deliveries. Long-range planning success depends on the Valley Water's ability to obtain adequate imported water supplies and on proper management of the local groundwater basin.

*Environmental & Climatic* - Valley Water contracts with the State of California to receive raw water from the California Central Valley through the State Water Project (SWP). Water supplied through this aqueduct (which originates from the Sacramento-San Joaquin Delta) may be limited because of subsidence problems, which are beginning to occur in that area and due to pumping restrictions associated with the protection of endangered species. Valley Water has also contracted with the Federal Central Valley Project (CVP) to supply raw water from the San Joaquin Valley via the Santa Clara Conduit. The reliance of water from inland sources through the SWP or the CVP is very critical; the loss of any or all of these sources due to pipe failure, levee failure, earthquake, or human intervention can have an extreme effect on SJW's water supply. Given the above factors which could result in an inconsistent water supply, it is crucial that SJW have sufficient backup wells and pumping capacity to supply customers for as long as several months solely from groundwater sources. SJW believes it has this capacity in an emergency if mandatory conservation is enacted.

*Water Quality* - The quality of groundwater in the basins, surface water from the Santa Cruz Mountains, or the raw water supply to Valley Water's treatment plants could decrease or be contaminated such that existing treatment facilities are not adequate to meet current drinking water standards. Contamination could cause a source of supply to become unusable until further treatment techniques are utilized, or the contamination is no longer a threat to the source of supply.

*Mechanical Failures* - All sources of water require mechanical equipment to bring water to the public. Mechanical failures may cause water service shutdowns until repairs are made. To reduce the occurrence of failures, SJW routinely inspects above-grade facilities at all stations. In addition, SJW has developed comprehensive asset management plans to determine risks associated with all major asset types (wells, pumps, tanks, pipelines, line valves, control valves, electrical equipment, and emergency generators) in the distribution system through probability of failure and consequence of failure evaluations. These asset management plans establish effective capital investment and operations and maintenance strategies.

**Groundwater Supply Reliability** – Groundwater supplies are often a reliable supply during normal and short-term drought conditions because they are local and their large storage retains available supply when surface flows become limited. However, groundwater supply availability does become threatened when overdraft occurs and when recharge and inflow decrease.

Some threats to groundwater supply reliability include:

- *Overdraft* – Under extended supply pressures, groundwater basins can enter overdraft conditions, which can have a series of consequences including subsidence.

- *Climate Change* – Climate change could increase the potential for overdraft by increasing demand, reducing other sources of supply, and reducing natural recharge and inflows from surface water and precipitation. Climate change is having a profound impact on California water resources, as evidenced by changes in snowpack, sea level, and river flows. These changes are expected to continue in the future and more precipitation will likely fall as rain instead of snow. This potential change in weather patterns will exacerbate flood risks and add additional challenges for water supply reliability.
- *Regional Growth* – Population growth could increase demands on groundwater supplies, potentially creating risk of overdraft. Regional growth could also increase the amount of contaminants entering groundwater basins as a result of increased urban runoff or other activities. Growth can also impact recharge areas by expanding impervious surfaces into areas that would otherwise represent entry points for surface water recharging local aquifers.

The Santa Clara Valley Subbasin is able to store the largest amount of local reserves and Valley Water, as the groundwater management agency for Santa Clara County, is tasked with maintaining adequate storage in this basin to optimize reliability during extended dry periods. As groundwater is pumped by SJW and other retailers and municipalities in Santa Clara County, Valley Water influences groundwater pumping reductions and thus reliability through financial and management practices to protect groundwater storage and minimize the risk of land subsidence.

**Imported Treated Surface Water Supply Reliability** – Valley Water was founded in 1929 and is the primary wholesale water supplier for Santa Clara County. Some of their core responsibilities are to provide safe, clean water for a healthy life, environment and economy. Valley Water’s supply originates from several sources including local reservoirs, the State Water Project and the federally funded Central Valley Project San Felipe Division. Water is piped into SJW’s system at various turnouts after being treated at one of three treatment plants owned and operated by Valley Water.

Valley Water’s current water supply reserves are insufficient to meet SJW needs throughout an extended drought. In addition, there are increasing concerns about the reliability of imported treated surface water during average years, driven by risks associated with climate change, reductions in imported water supplies, revenue requirements, and threats to infrastructure.

- *Climate Change* – In Santa Clara County, climate change is anticipated to decrease the frequency of precipitation events, but the intensity of precipitation events may increase. Climate change is expected to decrease imported water supplies as a result of reduced snow pack. Potential effects of climate change on Delta-conveyed imported water supply availability have been incorporated into Valley Water’s water supply projections.
- *Reductions in Imported Water Supplies* – Over the last 15 years, major changes to state and federal water project operations have resulted from regulations to protect Delta water quality and help the recovery of endangered and threatened fish species. These regulations result in a reduction of Delta exports at certain times of the year. There is a possibility that Delta exports will be further impacted by future regulations.



- *Revenue Requirements* – Increased funding will be required for Valley Water to implement a program of activities to ensure water supplies are diversified and reliable to meet current and future demands and that treated water quality standards are met.
- *Threats to Infrastructure* – Valley Water’s imported supply infrastructure must travel large distances to reach turnouts. As California is a seismically active state, infrastructure could be damaged and the result would be a disruption to water supply availability. California’s water supply infrastructure is also potentially a target for acts of terrorism.

SJW actively worked with Valley Water during the development of their WSMP 2040 to ensure the following principles were considered:

- Promotion of additional sources of local water supply, such as indirect potable reuse, direct potable reuse, desalination, additional conservation, and an expanded recycled water distribution system
- Coordination of operations with all retailers and municipalities to ensure as much surplus water as possible is available for use in dry years
- Pursuit of innovative transfer and banking programs to secure more imported water for use in dry years

Valley Water’s previous call for a 30 percent reduction during the recent drought and current call for a 20 percent reduction in water usage highlights that more investments in local water sources are necessary to ensure a reliable source of supply during multiple-dry water years.

**Supply Reliability by Type of Water Year** – Valley Water’s Urban Water Management Plan identified average, single-dry, and multiple-dry years for water supply reliability planning. According to Valley Water, these years correspond to:

- Average Year (1922 – 2015): average supply over the hydrologic sequence of 1922 – 2015.
- Single-Dry Year (1977): Within the historic record, this was the year with the estimated lowest amount of total supply
- Multiple-Dry Years (2013 – 2015): this is a multiple dry year period that puts the most strain on the county’s water supplies

Water supplies presented below are based on Valley Water’s water evaluation and planning system model. According to Valley Water, this model simulates their water supply system comprised of facilities to recharge the county’s groundwater basins, local water systems including the operation of reservoirs and creeks, treatment and distribution facilities, and raw water conveyance systems. The model also accounts for non- Valley Water sources and distribution of water in Santa Clara County such as imported water from San Francisco Public Utilities Commission, recycled water, and local water developed by other agencies.

**Table 9: Basis of Water Year Data**

Year Type	Base Year	% of Average Supply
Average Year	1922-2015	100%
Single-Dry Year	1977	100%
Multiple-Dry Years 1 <sup>st</sup> Year	2013	95%
Multiple-Dry Years 2 <sup>nd</sup> Year	2014	85%
Multiple-Dry Years 3 <sup>rd</sup> Year	2015	66%

**Average Water Year** – The average water year represents average supply over the hydrologic sequence of 1922 through 2015. SJW anticipates adequate supplies for years 2020 to 2040 to meet system demand under average year conditions.

**Table 10: Supply and Demand Comparison – Average Water Year (AF/yr) <sup>1</sup>**

	2020	2025	2030	2035	2040
<b>Demand</b>	140,435	145,066	149,967	155,289	160,877
<b>Demand Met by Water Supply</b>	140,435	145,066	149,967	155,289	160,877
<b>Demand Met by Conservation</b>	0	0	0	0	0

<sup>1</sup>Does not include recycled water or raw water and includes demands associated with the Google Project

**Single-Dry Water Year** – The single-dry year was the year with the lowest amount of total supply. Table 11 shows supplies, with the use of reserves, can meet demands during a single-dry year through 2035 assuming reserves are at healthy levels at the start of a year and projects and programs identified in Valley Water’s WSMP 2040 are implemented. If reserves are low at the beginning of a single-dry year, Valley Water may call for water use reductions in combination with using reserves. As later discussed within the Water Demand Management Measures section, SJW has filed with the California Public Utilities Commission (CPUC), water-waste provisions promoting conservation that would go into effect during a drought. The result of these provisions would assume to be a reduction in anticipated demand due to conservation such that demand equals available water supplies.

**Table 11: Supply and Demand Comparison – Single-Dry Water Year (AF/yr) <sup>1,2</sup>**

	2020	2025	2030	2035	2040
<b>Demand</b>	140,435	145,066	149,967	155,289	160,877
<b>Demand Met by Water Supply</b>	140,435	145,066	149,967	155,289	151,308
<b>Demand Met by Conservation</b>	0	0	0	0	9,569

<sup>1</sup>Does not include recycled water or raw water and includes demands associated with the Google Project.

<sup>2</sup>In 2040, there is a shortage of water available compared to the demand typical of that type of year. Valley Water has established a level of service goal of 100% during normal years and 80% during drought years to minimize water rates, and thus a 20% call for conservation will meet this deficit.

**Multiple-Dry Water Years** – The multiple-dry year period used in this analysis assumes a repetition of the hydrology that occurred in 2013 through 2015, which is the multiple-dry year period that puts the most strain on the county’s water supplies. During multiple-dry year droughts, voluntary and mandatory conservation will be needed. Valley Water will continue to work on reducing multiple-dry year deficits by securing more reliable or diverse water supplies.



**Table 12: Supply and Demand Comparison – Multiple-Dry Water Years (AF/yr) <sup>1,2</sup>**

		2020	2025	2030	2035	2040
<b>First Year</b>	<b>Demand</b>	140,435	145,066	149,967	155,289	160,877
	<b>Demand Met by Water Supply</b>	140,435	145,066	149,967	155,289	160,877
	<b>Demand Met by Conservation</b>	0	0	0	0	0
<b>Second Year</b>	<b>Demand</b>	140,435	145,066	149,967	155,289	160,877
	<b>Demand Met by Water Supply</b>	125,373	144,471	138,815	132,742	131,428
	<b>Demand Met by Conservation</b>	15,062	595	11,152	22,547	29,449
<b>Third Year</b>	<b>Demand</b>	140,435	145,066	149,967	155,289	160,877
	<b>Demand Met by Water Supply</b>	97,550	122,945	112,926	100,779	95,089
	<b>Demand Met by Conservation</b>	42,885	22,121	37,041	54,510	65,788

<sup>1</sup>Does not include recycled water or raw water and includes demands associated with the Google Project.

<sup>2</sup>In the second and third year of the worst-case historical multi-year droughts, there is a shortage of water available compared to the demand typical of that type of year. Valley Water has established a level of service goal of 100% during normal years and 80% during drought years to minimize water rates, and thus there can be up to a 20% call for conservation to meet this deficit (or more short-term conservation until additional water supplies are secured).<sup>5</sup> Over the next 20 – 30 years, Valley Water is pursuing over \$1 billion in water supply projects to meet the 80% level of service goal for all drought years.

**Distribution System Supply Reliability** – The proposed Google Project will increase SJW’s system wide water demands up to about 3 million gallons per day (mgd) under average day demands and up to 4.5-mgd under maximum day demands (MDD). As part of SJW’s groundwater well asset management plan, a well supply capacity evaluation was performed to analyze SJW’s water supply capacity under multiple scenarios, including an emergency scenario following a major earthquake based on forecasted maximum day demands in 2040. The emergency scenario focused on ensuring SJW can continue meeting its customer demands when relying only on its groundwater supply. The analysis showed that SJW’s current groundwater supply was sufficient to meet future 2040 maximum day demands within the entire system and that SJW has excess system capacity.

The proposed Google Project will result in a large water demand increase in one small pocket of the Cambrian zone. This is one of SJW’s largest pressure zones and there are multiple potable water supply inputs into this zone. However, to ensure SJW continues having operational flexibility to move water around its distribution network as needed, SJW plans to install a new regulating station about ½ a mile away from Diridon Station. This new regulating station will be capable of moving up to 5.7 mgd of water into Cambrian Zone and is planned for SJW’s 2021 capital improvement project budget.

**Regional Supply Reliability** – Valley Water’s Ensure Sustainability water supply strategy has three key elements:

1. Secure existing supplies and facilities
2. Optimize the use of existing supplies and facilities
3. Expand water use efficiency efforts

<sup>5</sup> Valley Water Board Agenda Memorandum, January 14<sup>th</sup>, 2019.

As part of this strategy, Valley Water's WSMP 2040 includes developing at least 24,000 AF/yr of additional recycled water (above and beyond the current target of 33,000 AF/yr of non-potable reuse) by 2040. Developing these local sources and managing demands reduces reliance on imported water supplies. In addition, Valley Water is working with multiple water agencies to investigate regional opportunities for collaboration to enhance water supply reliability, leverage existing infrastructure investments, facilitate water transfers during critical shortages, and improve climate change resiliency. Projects to be considered will include interagency interties and pipelines; treatment plant improvements and expansion; groundwater management and recharge; potable reuse; desalination; and water transfers. This program may result in the addition of future supplies for Valley Water.

## WATER DEMAND MANAGEMENT MEASURES

SJW is a signatory of the California Urban Water Conservation Council (CUWCC) and signed the CUWCC Memorandum of Understanding (MOU) in February 2006. The CUWCC is a partnership of water suppliers, environmental groups, and others interested in California water supply who have come together to agree on a set of Best Management Practices (BMPs) for water conservation in the state. Additionally, SJW has its own water-waste provisions that come into effect when there is a water shortage. The CPUC has set forth the rules regarding water waste and water shortages governing investor owned utilities such as SJW. The CPUC rule relating to this is Rule 14.1.<sup>6</sup> This rule states that when there is a low-level water shortage that prompts a call for voluntary conservation by customers, a list of water-waste provisions goes into effect. Rule 14.1 also has provisions for high-level water shortages when mandatory conservation measures are deemed necessary.

SJW provides a full range of water conservation services to both residential and commercial customers. The cornerstone of SJW's conservation programs is the water audit program. The audit program is an excellent method for customers to learn about ways to reduce their consumption, as well as identify and fix any leaks they may have. The audits are performed at a customer request, typically in response to a high water bill concern and/or in response to marketing efforts. Audits are performed for both residential and commercial customers.

Valley Water offers conservation programs, such as rebates for high efficiency toilets and washing machines. SJW takes advantage of all regional rebate programs and all of Valley Water's rebate programs are offered to SJW customers. Typically, customers are directed to specific rebate programs during the course of a water audit based on a customer's need. Customers can also access rebates directly from retail outlets when purchasing equipment such as high efficiency washing machines. SJW collaborates with Valley Water on public outreach and education including such items as customer bill inserts and conservation campaign advertising.

SJW has also increased the outreach and educational programs on outdoor water use. SJW constructed a water-smart demonstration garden that is open to the public. Customers can visit the garden in person or take a virtual tour on SJW's website. SJW also developed a dedicated water wise landscaping website where customers can access a plant information database that includes hundreds of low water

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<sup>6</sup> <https://www.sjwater.com/customer-care/help-information/tariff-book>

use plants as well as a photographic database of water wise gardens in the San Jose-Santa Clara County area. The landscaping website and demonstration garden tour is accessible from SJW's homepage.

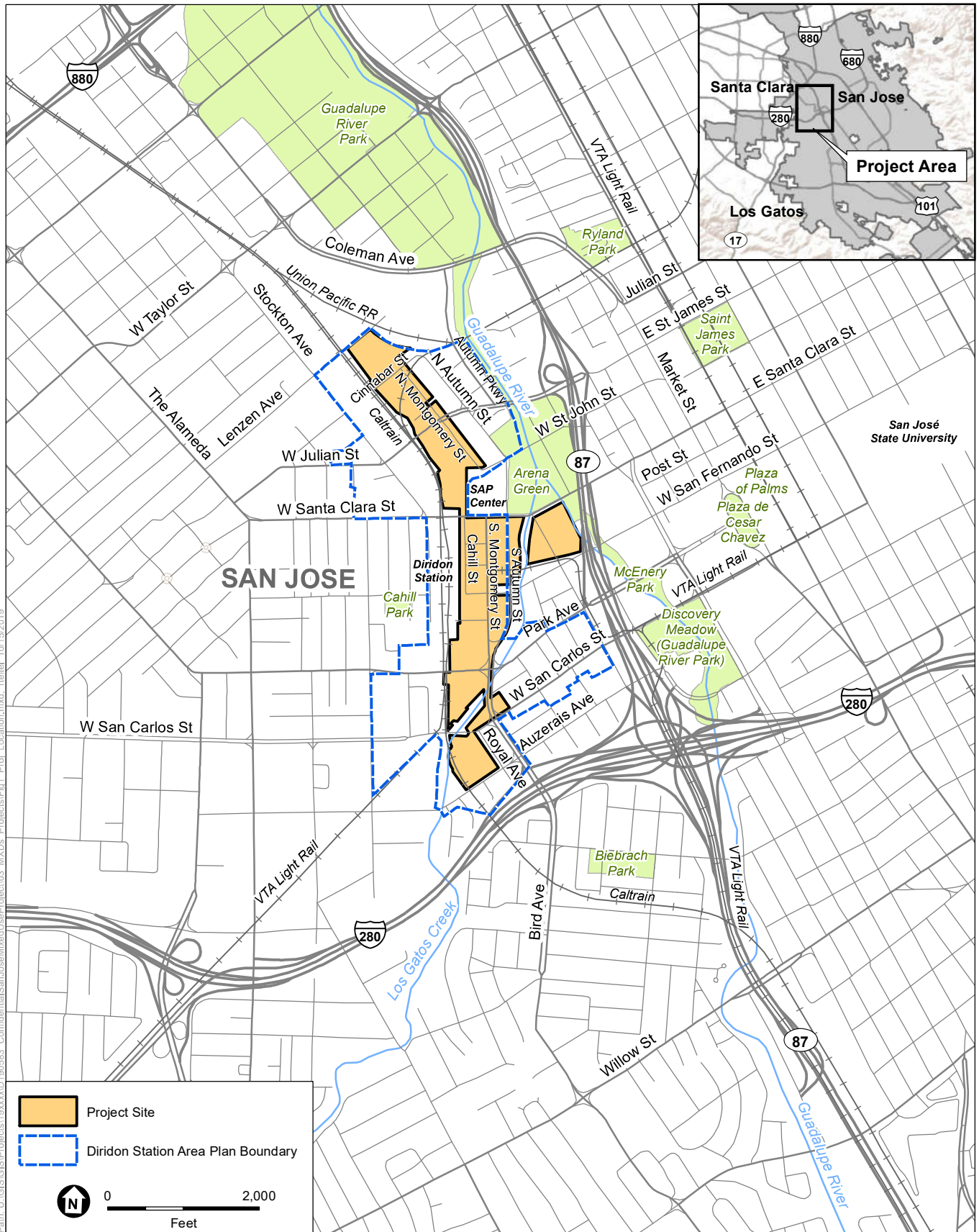
In addition to these programs, SJW engages in other activities that contribute to the overall goal of reducing water waste, but are not specifically designated as conservation or water management programs. These include SJW's meter calibration and replacement program, corrosion control program, valve exercising program and metering all service connections.

## SUMMARY

This Water Supply Assessment represents a comprehensive water supply outlook for the Downtown West Mixed-Use Project, referred to as the Google Project. In summary:

- (1) Total net potable water demand for the Google Project is estimated at about 3,290 AF/yr, which represents a 2.2% increase in total system usage when compared to SJW's pre-drought 2013 potable water production. The increased demand associated with this Project is consistent with SJW's 2015 Urban Water Management Plan, which projected a 12.3% increase in total system demand between actual 2013 demand and projected 2040 demand.
- (2) SJW currently has contracts or owns rights to receive water from the following sources:
  1. Groundwater – from the Santa Clara Valley Subbasin
  2. Imported and local surface water – from Valley Water
  3. Local surface water – from Los Gatos Creek, Saratoga Creek, and local watersheds
  4. Recycled water – from South Bay Water Recycling
- (3) SJW works closely with Valley Water to manage its demands and imported water needs. The projected water demand for this development is within previously determined growth projections for water demand in SJW's system.
- (4) SJW plans to install a new pressure regulating station about ½ a mile away from Diridon Station. This new regulating station will be capable of moving up to 5.7 mgd of water into the Google Project development area and is planned for inclusion in SJW's 2021 capital improvement project budget.

SJW is able to meet the needs of the service area through at least 2035 for average and single-dry years without a call for water use reductions. The impact of the Google Project is not consequential since it is located in a zone with many water supply inputs. SJW has the capacity to serve this project through buildout based on SJW's current water supply capacity and Valley Water's proposed water supply projects. According to Valley Water, it is pursuing water supply solutions to ensure that no more than 20 percent conservation will be required during any future drought, and SJW is committed to working with Valley Water to meet future demand and mitigate future shortages. After comparing the estimated increase in total system demand associated with the Google Project to water supplies, based on both the SJW and Valley Water Urban Water Management Plans, SJW has determined that the water quantity needed for this project is within projections of normal growth and there is sufficient water available to serve the Google Project.



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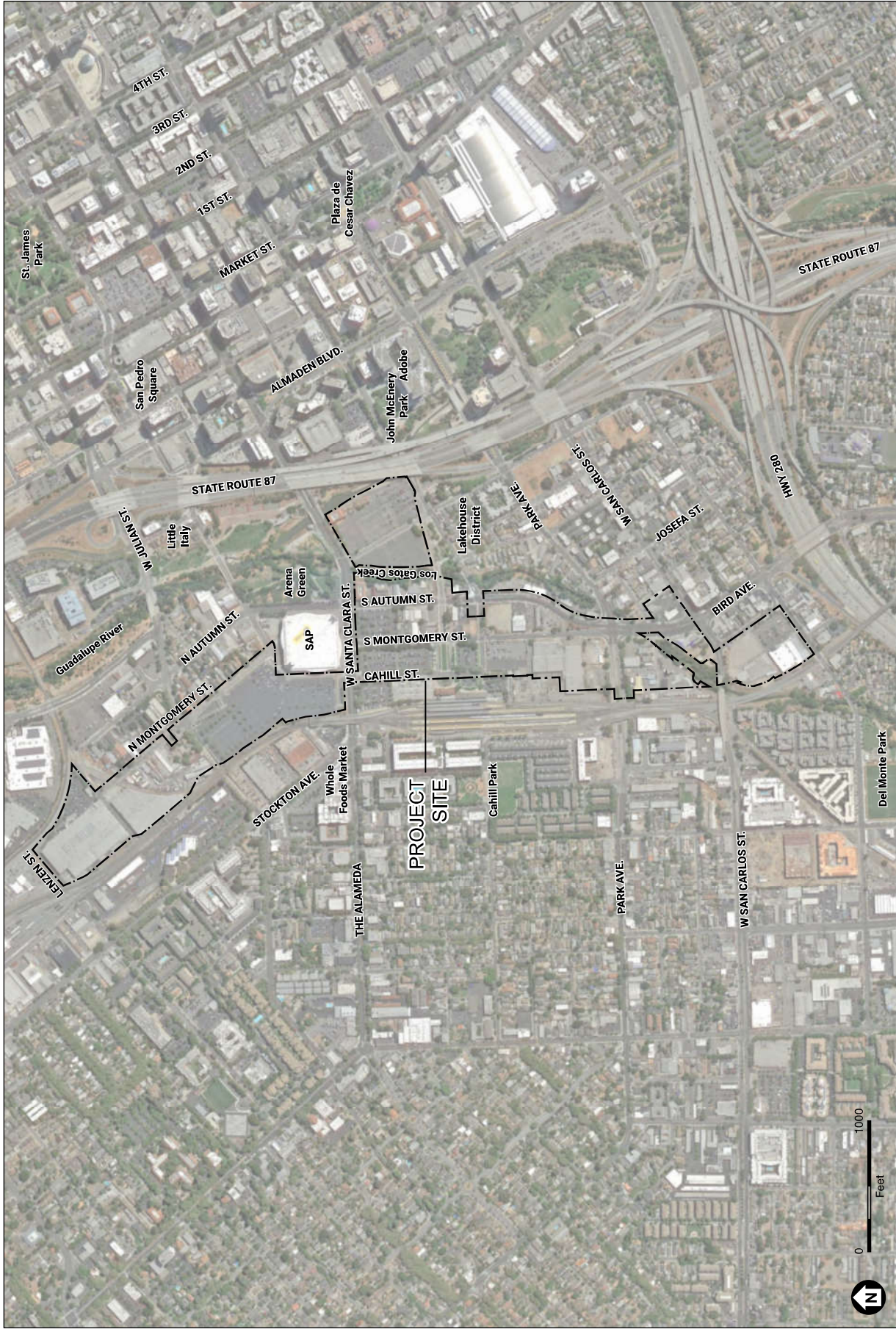
SOURCES: ESA, 2019; ESRI, 2019

Downtown West Mixed-Use Plan

**Figure 1**  
Project Location Map







D:\190583.00 - Confidential San Jose Mixed-Use Project\05 Graphics-GIS-Modeling\Illustrator

SOURCES: Google LLC and SITELAB urban studio, 2019

Downtown West Mixed-Use Plan

**Figure 2**  
Aerial Photo of Project Area





## Technical Memorandum

**3/18/2020**

To: Paul Dunne  
Lend Lease

Prepared by: Madeleine Craig, EIT and Michael Bustillo-Sakhai, EIT  
Reviewed by: Amelia Luna, PE and Andy Leahy, PE

### **RE: Downtown West Mixed-Use Project Water Demands**

As part of the entitlement process for the Downtown West Mixed-Use Project (Project), a Water Supply Assessment (WSA) will be conducted by San José Water Company (SJ Water). As part of the City's request for SJ Water to complete a WSA study for the Project, Sherwood Design Engineers, Inc. (SDE) has prepared this technical memorandum to provide additional information to the City of San José and SJ Water.

In preparation for the Downtown West WSA, the Project team reviewed several recent WSAs prepared by SJ Water to determine typical demand factors that have been utilized in the City of San José. The anticipated water consumption for the proposed development has been developed from similar, high density urban developments and from applicable building certification programs, such as LEED, and the CalGreen code. Through these studies, the Project team identified discrepancies between the typical demand factors for the City of San José and the anticipated water consumption for the Project. To ensure that the Downtown West WSA accurately reflects the Project's impacts on regional water supplies, the Project team is proposing that SJ Water review the demand factors proposed in Table 1.

The Project team is available to meet and discuss this information with the City and SJ Water staff should any questions arise or should any additional information be required. Thank you for the opportunity to present this information to City of San José and to San José Water Company.

**TABLE 1: Comparison of SJ Water typical demand factors and Project proposed demand factors.**  
Demand factors include both potable and non-potable water demands.

SJ Water Typical Land Use Types	Units	SJ Water Typical Demand Factors <sup>1</sup>	Proposed Demand Factors for the Project				Proposed Land Use Types
			Total Demand	Non-Potable		Potable	
				Cooling Demand	Interior (toilet flushing)		
Office Space	gal/sf-d	0.1	<b>0.055</b>	0.010	0.010	0.035	Office
Residential/ Apartment	gal/unit-d	340 <sup>2</sup>	<b>71.8</b>	7.00	8.64	56.2	Residential
Hotel	gal/room-d	100	<b>64.1</b>	4.27	9.60	50.3	Hotel
Hotel	gal/room-d	100	<b>35.0</b>	4.27	4.80	26.0	Corporate Accommodations
Retail/ Commercial	gal/sf-d	0.2 <sup>3</sup>	<b>0.10<sup>4</sup></b>	0.01	0.05	0.04	Retail
Retail/ Commercial	gal/sf-d	0.2 <sup>3</sup>	<b>0.25<sup>5</sup></b>	0.01	0.00	0.24	Restaurant
Movie Theater	gal/sf-d	0.1	<b>0.035</b>	0.010	0.010	0.015	Events
Light Industrial	gal/sf-d	0.18	<b>0.07</b>	0.01	0.05	0.01	Logistics/ Warehouse
Open Space/Park (Native Plants)	AFY/acre	2.6	<b>2.6<sup>6</sup></b>	n/a			Irrigation

Notes:

1. Project demand factors estimated based on the average of values presented in previous WSAs in San José including: Samaritan Medical Center (2015), Downtown Strategy 2040 (2018), Santana Row Expansion (2014), 1410 South Bascom Avenue (2019), Envision San José 2040 (2010), and 237 Industrial Center (2017).
2. A range of 300-400 gal/unit-d was presented for Residential/Apartments in the WSAs.
3. A range of 0.10-0.25 gal/sf-d was presented for Retail/Commercial in the WSAs.
4. The lower value presented in the Retail/Commercial values in the WSA range is appropriate for proposed retail.
5. The higher value presented for the Retail/Commercial land type in the WSAs is appropriate for proposed restaurant.
6. Irrigation demand will be met with recycled water.