California Senate Bill 610
Water Supply Assessment

for
State Street Village

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ACRONYMS AND ABBREVIATIONS

Act ..... Urban Water Management Planning Act of 1983
AFY ..... Acre Feet Per Year
amsl ..... above mean sea level
CCF ..... Hundred Cubic Feet
CEQA ..... California Environmental Quality Act
CVP ..... Central Valley Project
CWC ..... California Water Code
DU ..... Dwelling Unit
DWR ..... Department of Water Resources
EIR ..... Environmental Impact Report (See PEIR)
EO ..... Executive Order
EVWD ..... East Valley Water District
FY ..... Fiscal Year
gpcd ..... Gallons Per Capita Per Day
gpd ..... Gallons Per Day
gpm ..... Gallons Per Minute
IRWMP ..... Integrated Regional Water Management Plan
IRUWMP ..... Integrated Regional Urban Water Management Plan
KSF ..... Thousand Square Feet
MCL ..... Maximum Contaminant Level
MGD ..... Million Gallons per Day
mg/L ..... Milligrams Per Liter
SAR ..... Santa Ana River
SB ..... Senate Bill
SBB ..... San Bernardino Basin
SB X7-7 ..... Water Conservation Act of 2009
SBVMWD, Valley District ..... San Bernardino Valley Municipal Water District
SCAG ..... Southern California Area of Governments
sf ..... Square Feet
SSV ..... State Street Village
SWP ..... State Water Project
SWRCB ..... State Water Resources Control Board
TAZ ..... Traffic Analysis Zone
USBR ..... U.S. Bureau of Reclamation
UWMP ..... Urban Water Management Plan
WSA ..... Water Supply Assessment
WSCP ..... Water Shortage Contingency Plan
WMP ..... Water Master Plan
WWTP ..... Wastewater Treatment Plant

EXECUTIVE SUMMARY

The purpose of the Water Supply Assessment is to satisfy the requirements under Senate Bill 610 (SB 610), Water Code Section 10910 et seq., that adequate water supplies are or will be available to meet the water demand associated with the proposed State Street Village development. SB 610 requires that a Water Supply Assessment (WSA), based on specific criteria, be prepared to document the sufficiency of available water supply for the City of Redlands water utility and the proposed project. This WSA is prepared for the State Street Village redevelopment project (SSV or Project). The WSA identifies water supply and reliability for the City of Redlands water supply system, now and into the future, and makes a determination regarding water supply sufficiency for the Project. **The WSA does not, nor is it intended to, identify infrastructure needs for service distribution for the Project.**

The City of Redlands is participating in a regional planning effort lead by the water wholesaler for the region, the San Bernardino Valley Municipal Water District (SBVMWD or Valley District). The regional plan includes separate chapters and appendices, each for a water retailer served by Valley District. The City of Redlands prepared their chapter of the 2020 Integrated Regional Urban Water Management Plan (IRUWMP). The City's chapter (2020 UWMP) determines the existing and projected water demand and supply specifically for the City. The 2020 SBVMWD IRUWMP was adopted July 1, 2021. The City of Redlands 2020 UWMP shows that the local water supplies for the City are sufficient for existing and projected water demands.

State Street Village is a 12.2-acre mixed-use community including residential, and commercial office and retail, and is currently planned for move-ins to begin in Year 2022 and buildout to occur in Year 2026. The land uses of the site formerly consisted of commercial and anchor retail outlets of the Redlands Mall, and public parking. This WSA identifies water supply and reliability to the City of Redlands, now and into the future, and makes a determination regarding water supply sufficiency for the Project. WSAs will continue to be a part of Redlands' ongoing planning efforts to optimize its water resources.

The WSA includes a discussion of the relevant legislation requiring the WSA, an overview of the proposed State Street Village, analysis of water demands for the City's existing service area including the Project over the next 20-plus years, and an analysis of reliability of the City's water supplies. This WSA includes discussion of the potential impacts the wholesale water agency (SBVMWD) has on the City of Redlands and concludes with a sufficiency analysis of water supply during normal, single-dry, and multi-dry year 'Drought Risk' pursuant to the new WSA requirements for the next 20 years.

Water Supply

The City of Redlands relies on local groundwater from the San Bernardino Basin (SBB) and surface water supplies from Mill Creek and the Santa Ana River. Supplemental water is purchased from the State Water Project for direct deliveries only when the local sources cannot provide it or is needed for water quality. Other sources for the City include stormwater capture, recycled water and exchanges and transfers with Valley District. The City also operates two interconnections - with Western Heights Water Company and with the City of Loma Linda - for enhanced supply reliability.

Water Demand

The City of Redlands water use is supplied by the potable water system for approximately 94 percent of Redlands total water demands. Potable and raw water demand (excluding recycled water) within Redlands' service area for Year 2020 was 25,892 AFY. Of these demands, approximately 61 percent are for single-family residential, 14 percent for multi-family residential, 12 percent for commercial and institutional connections, and the remainder for irrigation.

The development of State Street Village will result in an estimated net increase of 198 AFY. The City's projected potable and raw water demand (excluding recycled water demand) is projected to be 29,735 AFY by Year 2045. Although State Street Village is not specifically mentioned in the City's 2020 UWMP, SSV estimated water demand is significantly less than the City's overall water demand projections during, and after, the years of estimated construction phasing of the Project, as follows:

2025		**2026**		**2027**	
State Street Village Projected Water Demand	**Redlands Planned Water Demand increase from Current (Yr 2020)**	**State Street Village Projected Water Demand**	**Redlands Planned Water Demand increase from Current (Yr 2020)**	**State Street Village Projected Water Demand**	**Redlands Planned Water Demand increase from Current (Yr 2020)**
187 AFY	906 AFY	198 AFY	1,095 AFY	198 AFY	1,284 AFY

Supply Sufficiency

The City of Redlands' current (Year 2020) total existing water production is 28,098 AFY and will meet its future water demands, including the demands for the proposed Project, from existing supply sources. The City's water utility will maintain 100 percent reliability with its current water supplies, i.e. local groundwater and surface water, and direct purchase of imported water when needed from the State Water Project through its wholesale water supplier, SBVMWD. Analysis of water demand and supply projections for the City include assessment for normal years, as well as single dry years, and the extended multi-year drought from the Drought Risk Assessment performed for the City's 2020 UWMP, and demonstrates that the City's water utility has water supply sources in place, by contract or other right, sufficient to meet existing and planned water demands, including the demands of the State Street Village project, both now and through the year 2045.

Conclusion

The information included in this WSA identifies a sufficient program of water supply for the City of Redlands, both now and into the future, including a sufficient water supply for the State Street Village development project.

1.0 INTRODUCTION

The purpose of the Water Supply Assessment (WSA) is to satisfy the requirements under SenateBill 610 (SB 610), Water Code Section 10910 et seq., that adequate water supplies are or will be available to meet the water demand associated with the proposed State Street Village redevelopment project (Project). SB 610 focuses on the content of a water supply agency's Urban Water Management Plan (UWMP). It also stipulates that, when an environmental impact report (EIR) is required in connection with a project, the appropriate water supply agency must provide an assessment of whether its total projected water supplies will meet the projected water demand associated with the Project. SB 610 applies to a proposed residential development of more than 500 dwelling units, or large commercial, industrial, or mixed-use development. The need for the WSA is determined by the lead agency for the Project.

The WSA identifies water supply and reliability of the City of Redlands water utility, both now and 20 years into the future, and makes a determination regarding water supply sufficiency for the Project. **The WSA does not, nor is it intended to, identify infrastructure needs for service distribution for the proposed project.**

The lead agency for CEQA (California Environmental Quality Act) studies is the City of Redlands. The City has determined the State Street Village project exceeds the development size threshold for requiring SB 610 compliance. The proposed State Street Village project encompasses approximately 12.2 acres within the City of Redlands bounded by Redlands Boulevard to the north, Citrus Avenue to the south, South Eureka Street to the west, and Orange Street to the east. The Project also includes the public parking lot south of Citrus Avenue as described in Section 3. The land uses of the site formerly consisted of commercial and anchor retail outlets of the Redlands Mall. Historical water uses have been tabulated in order to provide a net water demand resulting from the State Street Village project. The recent consumption records may indicate a reduction of water consumption from many years ago when the Mall operated at full capacity. The SSV project proposes to construct separate buildings (Buildings 1 through 5) with residential, commercial office, and commercial retail totaling 750 to 800 residential units and approximately 845,745 square feet of building area.

The City of Redlands prepared their chapter of the 2020 Integrated Regional Urban Water Management Plan (IRUWMP), which was adopted as part of the regional plan July 1, 2021, and used as the primary reference for this WSA. The City is participating in a regional planning effort lead by the water wholesaler for the region, the San Bernardino Valley Municipal Water District (SBVMWD). The IRUWMP includes separate chapters and supporting appendices, each for a water retailer served by the SBVMWD. As a water retailer within SBVMWD wholesale service area, the City's chapter (2020 UWMP) determines the existing and projected water demand supply specifically for the City. The 2020 SBVMWD IRUWMP was adopted by Valley District and the participating agencies July 1, 2021. Although the City's chapter does not specifically mention the State Street Village project by name, it (also referred to as City's 2020 UWMP) shows that the local water supplies for the City are sufficient for existing and projected water demands.

The WSA includes a discussion of the Senate Bill 610 legislation, analysis of overall water demands within the Redlands water utility service area, as well as the demands of the Project and other currently planned development projects for the next 20 years. Pursuant to the legislation, the WSA also includes a summary of the current and future reliability of the City's water supplies.

1.1 References

The following documents were used as reference information in the development of this WSA:

1. 2020 Integrated Regional Urban Water Management Plan (SBVMWD, July 2021), Chapter 4 – City of Redlands
2. 2015 Regional Urban Water Management Plan (SBVMWD, June 2017)
3. 1998 City of Redlands Water Master Plan
4. 2014 East Valley Water District Water Master Plan

2.0 LEGISLATION

2.1 SB 610 – Water Supply Planning

Senate Bill (SB) 610 became effective on January 1, 2002, amending the California Water Code (CWC) by requiring detailed analysis of water supply availability for certain types of development projects. (See California Water Code Division 6, Part 2.10, Sections 10910-10915 Water Supply Planning to Support Existing and Planned Future Use.) The primary purpose of SB 610 is to improve the linkage between water and land use planning by ensuring greater communication between water providers and local planning agencies, and ensure that land use decisions for certain large development projects are made based on complete information as to whether sufficient water supplies are available to meet project demands. The WSA must include a discussion of the availability of an identified water supply under normal-year, single-dry-year, and multiple-dry-year conditions over a 20-year projection, accounting for the projected water demand of the project in addition to other existing and planned future uses of the identified water supply.

This WSA has been prepared pursuant to the requirements of the California Water Code for the approach, required information, and criteria, confirming City of Redlands has sufficient water supplies to meet the projected demands of the State Street Village project (SSV or Project) in addition to existing and planned future uses, over the next 20 years. The City's 2020 UWMP of the SBVMWD Regional Urban Water Management Plan update was provided by City staff and used as a foundational document for preparing the WSA in compliance with the Water Code.

The provisions of the Water Code identify the UWMP (or IRUWMP) as a planning document which can be used by a water supplier in preparing a WSA, and projects that rely on groundwater must include a review of any information contained in the UWMP (or IRUWMP) relevant to the project. The water agency must determine whether projected water supplies are sufficient to meet the demand of the project, in addition to existing and planned future water uses. The lead agency for the preparation of an Environmental Impact Report (EIR) for a proposed project is required, under California Environmental Quality Act (CEQA) guidelines Article 7 EIR Process and Article 9 Contents of Environmental Impact Reports, to consult with the water agency serving a proposed project and to include in the EIR information provided by the water agency.

The City's 2020 UWMP (chapter) document of the regional plan by SBVMWD, was prepared pursuant to California Water Code Division 6, Part 2.55, Section 10608 (Sustainable Water Use and Demand Reduction) and California Water Code Division 6, Part 2.6, Sections 10608-10656 (Urban Water Management Planning). The UWMP describes future water demands and future availability of the water supply sources used by the City of Redlands. The State Street Village WSA uses the base water supply and demand information from the UWMP.

2.2 California Water Code (Sections 10910-10915)

California Water Code Division 6, Part 2.10, Sections 10910-10915 requires a WSA to provide a description of all water supply projects and programs which may be undertaken to meet total projected water use over the next 20 years, including the water use of the proposed Project. The California Water Code requires a city or county which determines a project is subject to CEQA to

identify any public water system(s) which may supply water for the proposed development and to request the public water system(s) to prepare a WSA for said project. If the water demands have been accounted for in a recently adopted urban water management plan, the water supplier may incorporate information contained in that plan to satisfy certain requirements of the WSA.

The California Water Code requires the assessment to include, along with other information, an identification of existing water supply entitlements, water rights, or water service contracts, relevant to the identified water supply for the State Street Village and the quantities of water received in prior years for the Project site pursuant to those entitlements, rights, and contracts.

As the lead CEQA agency, the City of Redlands has determined that the Project is subject to CEQA. At the time the CEQA lead agency determines the Project is subject to CEQA review, the lead agency must identify and consult with the public water system that will supply water for the Project to assist in evaluating whether the Project will:

> (a) require or result in the relocation or construction of new or expanded water supply facilities, the construction or relocation of which could cause significant environmental effects; and
>
> (b) have sufficient water supplies available to serve the Project, as well as serve other foreseeable future development during normal, single-dry, and multiple-dry years.

The Project is located within the service area of the City of Redlands, and the City has requested the water utility prepare a WSA for the Project. The City will make the ultimate independent determination as to whether there is adequate water supply for the proposed Project, upon consideration of the entire administrative record. This WSA provides information on the Project's proposed water supplies and provides data to support the sufficiency of supply. This WSA includes an overview of the proposed Project, a discussion of the City's total projected water supplies available during normal, single-dry, and multiple-dry water years during a 20-year projection, and concludes that those supplies will be sufficient to meet the projected water demand associated with the proposed Project, in addition to the City's existing and planned future uses.

2.3 SB X7-7 and EO B-37-16 and EO B-40-17

The Water Conservation Act of 2009 (SB X7-7) requires all California urban water agencies to set and meet certain demand reduction targets in order to assist the State in reducing urban water use 20 percent by 2020. SB X7-7 also requires each agency to monitor its progress toward its targets. This was implemented for the purpose of meeting the mandate to reduce per capita urban water consumption by 20 percent statewide. SB X7-7 describes the overall process by which all purveying agencies are to comply with the requirements. It specifically identifies methods for establishing urban water use targets.

Governor Jerry Brown issued a State of Emergency and Continued State of Emergency in 2014 in response to the persistent state-wide drought. In April 2015, Executive Order (EO) B-29-15 was issued by the Governor, which required a water use reduction of 25 percent from 2013 usage levels, throughout the State. The EO outlined specific water use reductions designed to increase the urgency to reduce water consumption and facilitate the ability of local agencies to implement and enforce

water conservation requirements.

Following unprecedented water conservation and plentiful winter rain and snow, on April 7, 2017 Governor Brown ended the drought State of Emergency in most of California, while maintaining water reporting requirements and prohibitions on wasteful practices. EO B-40-17 lifts the drought emergency in all California counties except Fresno, Kings, Tulare, and Tuolumne, where emergency drinking water projects will continue to be implemented to help address diminished groundwater supplies. The Order also rescinds two emergency proclamations from January and April 2014 and four drought-related Executive Orders issued in 2014 and 2015, as briefly discussed above. EO B-40-17 builds on actions taken in EO B-37-16, which remains in effect, to continue making water conservation a way of life in California. The State Water Resources Control Board (SWRCB) maintains urban water use report requirements and prohibitions on wasteful practices such as watering during or after rainfall, hosing off sidewalks, and irrigating ornamental turf on public street medians. As directed by Governor Brown in EO B-37-16, the Board will separately take action to make reporting of wasteful water practices permanent.

The Executive Director for the SWRCB, on April 26, 2017, rescinded the water supply stress test requirements and remaining mandatory conservation standards for urban water suppliers. The action was in response to the Governor's earlier announcement ending the drought state of emergency and transitioning to a permanent framework for making water conservation a California way of life.

3.0 STATE STREET VILLAGE PROJECT

3.1 Project Description

The State Street Village re-development project (Project) site encompasses approximately 11.02 acres of the former Redlands Mall and adjacent parking south of Citrus Ave. The proposed mixed-use portion of the Project is within the Redlands Mall site and consists of attached residential, commercial office and retail uses bounded by Redlands Boulevard (to the north), Citrus Avenue (to the south), Orange Street (to the east) and Eureka Street (to the west). The Project also includes proposed Commercial retail on approximately 1.17 acres south of Citrus Avenue currently used as public parking between Eureka Street and 4th Street. The regional location of the SSV project site is shown in **Exhibit 1**.

The previous land uses of the Redlands mall include a large single structure for retail anchors and smaller department stores totaling 193,210 square feet of retail space. The site currently includes asphalt pavement parking, hardscaped and landscaped areas, and concrete sidewalks that will be demolished and replaced for the State Street Village development project.

The Project is planned to include approximately 748,267 square feet of residential space for up to 800 residential units; 85,256 square feet of commercial retail space; and 12,222 of commercial office space in five new multi-level buildings north of Citrus Avenue and one new building south of Citrus Avenue. The buildings range in height from one to five levels. Residential and office units will occupy the upper levels of five buildings north of Citrus Avenue and commercial retail will occupy the lower level of all six buildings. **Exhibit 2** shows the site plan for State Street Village.

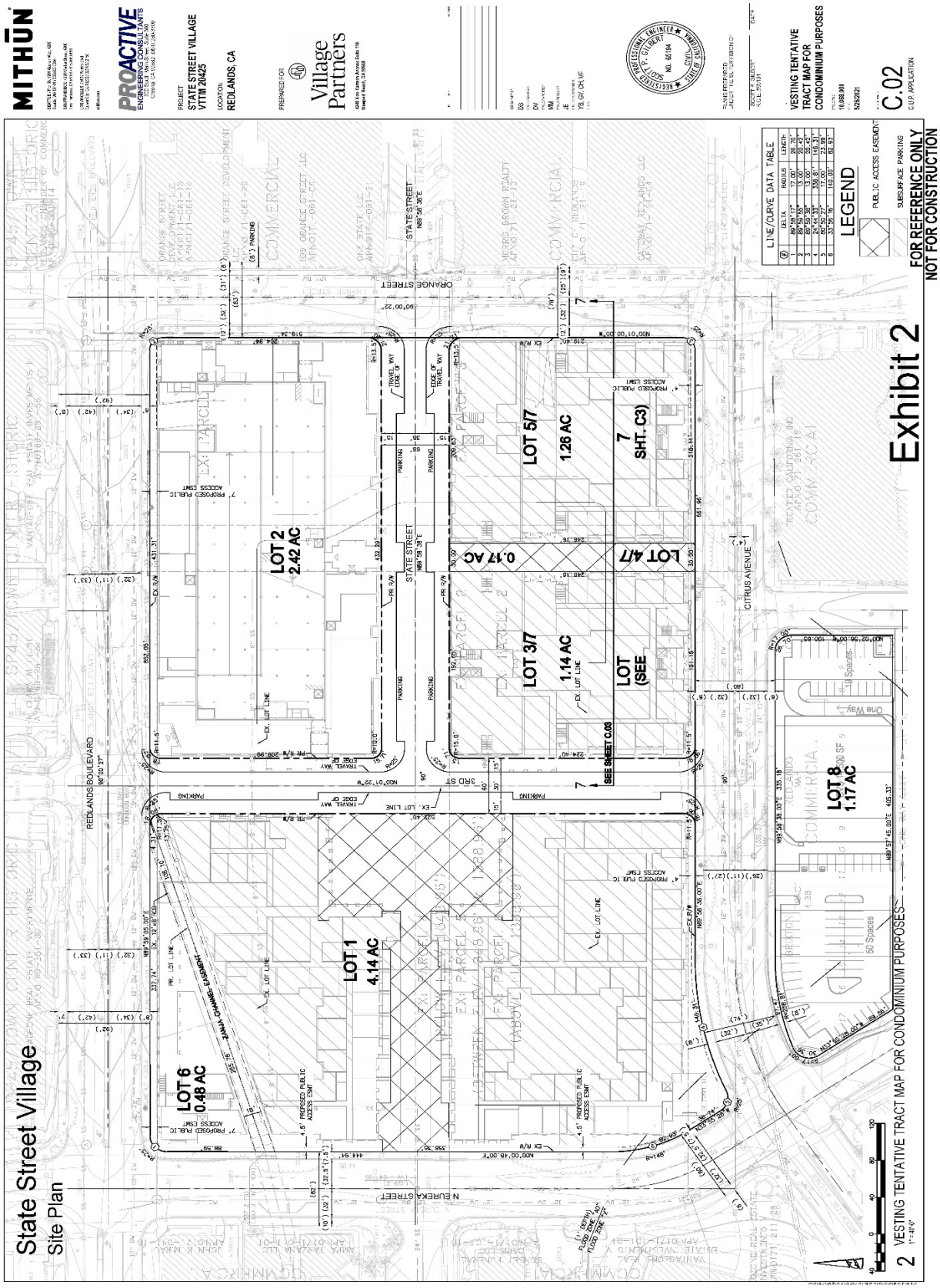
MITHŪN
PROACTIVE ENGINEERING CONSULTANTS
PROJECT
STATE STREET VILLAGE
VTTM 20425
LOCATION
REDLANDS, CA
PREPARED FOR
Village Partners
VESTING TENTATIVE TRACT MAP FOR CONDOMINIUM PURPOSES
C.02
C.U.P. APPLICATION
Exhibit 2
FOR REFERENCE ONLY
NOT FOR CONSTRUCTION
LEGEND
PUBLIC ACCESS EASEMENT
SUBSURFACE PARKING
LINE/CURVE DATA TABLE
DELTA
RADIUS
LENGTH
LOT 1
4.14 AC
LOT 2
2.42 AC
LOT 3/7
1.14 AC
LOT 4/7
0.17 AC
LOT 5/7
1.26 AC
7
SHT. C3)
LOT 6
0.48 AC
LOT 8
1.17 AC
STATE STREET
ORANGE STREET
REDLANDS BOULEVARD
CITRUS AVENUE
3RD ST
N EUREKA STREET
SEE SHEET C.03
State Street Village
Site Plan
2 VESTING TENTATIVE TRACT MAP FOR CONDOMINIUM PURPOSES

Table 3-1 summarizes the existing and proposed developments.

Table 3-1: Existing and Proposed Land Use

Land Use	Building	Classification	Dwelling Units / Building Area	Land Area
EXISTING				
Redlands Mall, north of Citrus Ave	-	Commercial	n/a	11.02
Public Parking, south of Citrus Ave	-	-	n/a	1.17
PROPOSED				
North of Citrus Ave				
Residential [1]	B1, B2, B3, B4A, B4B	Residential (MFR)	750-800 DUs 748,267 sf	11.02
Office	B2	Commercial	12,222 sf	
Retail	B1, B2, B4A, B4B	Commercial	70,756 sf	
South of Citrus Ave				
Retail	B5	Commercial	14,500 sf	1.17
TOTAL proposed			**800 DUs** **845,745 sf**	**12.19**

[1] Includes Community Building and Amenities

3.2 Project Water Demands

The land use changes proposed as part of the Street State Village Project will result in increased water demands. The City of Redlands Water Master Plan (1998) is currently being updated and is not expected to be finalized until later this year. The existing WMP includes usage factors that may be outdated considering the recent mandates for water use reduction throughout the region and State. Pursuant to the recent legislation following unprecedented drought throughout the state, many southern California water agencies have demonstrated a 'hardened' reduction in water use by more than 25 percent since implementation of the Water Conservation Act of 2009.

East Valley Water District (EVWD) operates a public water system adjacent to Redlands and is also served by the City's wholesaler, SBVMWD. EVWD's current Water Master Plan analyzed water use and established planning factors to use for future development accounting for the mandated lower per-capita water use. However, EVWD's factors are based on average 'per-acre' water usage. State Street Village FAR (floor-area ratio) to overall lot acreage is calculated at 1.6 (845,745 sf over 12.2 acres). Typically FARs city-wide are much lower than 1.0 in most San Bernardino County cities, and average between 0.33 and 0.50. This would require a per-acre usage factor adjustment to account for the higher density. Thus, the EVWD planning factors are adjusted accordingly based on standard FAR of 0.33 to 0.50 as follows:

- Based on FAR = 0.33: adjustment factor = 1.6/0.33 = 4.8
- Based on FAR = 0.50: adjustment factor = 1.6/0.50 = 3.2

Therefore, a factor of 4.8 or 3.2 is appropriate for water demand estimating purposes using 'per-acre' usage factors for the Water Supply Assessment.

In addition, it is assumed the factors do not include irrigation, therefore maximum allowances implemented by typical landscape ordinances since the Water Conservation Act were used for the landscaped area proposed for State Street Village. Planning factors for Irrigation resulting from landscape ordinance equations typically range from 1.0 to 2.0 acre-feet per acre per year (AF/Ac/Yr or feet per year). For the purposes of this WSA, an allowance of 2.0 feet per year was used for the WSA for conservative analysis. It should be noted that State Street Village has been earmarked for recycled water service by the City. **Table 3-2** is a summary of the water demand factors used for the SSV demand analysis for the WSA.

Table 3-2: Water Demand Factors

Water Demand Factor Classification	Average Demand Factor [1]	High Density Factors [2]		Adjusted Average Demand Factor [3]
Residential		Low	High	
Multi-Family Residential	3,500 gpd/acre	3.2	4.8	16,800 gpd/acre
Non-Residential				
Commercial Office	2,050 gpd/acre	3.2	4.8	9,840 gpd/acre
Commercial Retail	2,050 gpd/acre	3.2	4.8	9,840 gpd/acre
Landscape	2.0 AF/Ac/Yr [4]	-	-	-

[1] Source: East Valley Water District Water Master Plan (MWH, February 2014), except as otherwise noted.

[2] Based on typical city-wide FARs for San Bernardino County ranging from 0.33 and 0.5.

[3] State Street Village overall floor area ratio is approximately 1.6, requiring an adjustment to the usage factor by up to 4.8 (based on assumed 0.33 average FAR city-wide).

[4] The City of Redlands proposes to serve SSV with recycled water for outdoor irrigation.

The existing site is occupied by 193,210 square feet of structures of the Redlands Mall, a regional shopping center that will be replaced by the Project. Recent consumption records provided by City staff for the Redlands Mall indicate minimal water demand and a vast reduction in Mall activity from its full capacity of several years ago. Therefore, the existing (or historic) site demands were estimated based on the EVWD usage factors with no adjustment due to the previous development FAR at roughly the city-wide average. The estimated Project water demands and estimated historical water use for the Project site are summarized in **Table 3-3a**.

Table 3-3a: Water Demand Estimate

Building/ Landscape	Type		Ac	Indoor Water Demand Factor [1]	Outdoor Water Demand Factor [2]	[3]	
	Land Use	Quantity				Indoor Demand	Outdoor Demand [4]
B1	Residential	368,799 sf					
	Comm Office	0 sf					
	Comm Retail	14,839 sf					
B2	Residential	132,896 sf					
	Comm Office	12,222 sf					
	Comm Retail	34,793 sf					
B3	Residential	25,564 sf					
	Comm Office	0 sf					
	Comm Retail	0 sf					
B4A	Residential	111,600 sf					
	Comm Office	0 sf					
	Comm Retail	10,743					
B4B	Residential	109,408 sf					
	Comm Office	0 sf					
	Comm Retail	10,381 sf					
B5	Residential	0 sf					
	Comm Office	0 sf					
	Comm Retail	14,500 sf					
Total	**Residential**	**748,267 sf**	**10.79**	16,800 gpd/Ac	-	181,188 gpd	
	Comm Office	**12,222 sf**	**0.18**	9,840 gpd/Ac	-	1,733 gpd	
	Comm Retail	**85,256 sf**	**1.23**	9,840 gpd/Ac	-	12,092 gpd	
	total	**845,745 sf**	**12.19**			**195,013 gpd**	
Landscape		74,835 sf			2.0 AF/Ac/Yr	-	4,392 gpd
						195,013 gpd	4,392 gpd
					Proposed Development Total	**199,405 gpd**	
						223 AFY	
Existing [5]	Comm Retail	181,410 sf	10.35	2,050 gpd/Ac[6]	-	21,211 gpd	
	Comm Office	11,800 sf	0.67	2,050 gpd/Ac[6]		1,380 gpd	
	Restaurant						
	total	193,210 sf	11.0			22,591 gpd	
					Historical Site uses Total	**22,591 gpd**	
						25 AFY	
					State Street Village Net Total Water Demand	**176,814 gpd**	
						198 AFY	

[1] Based on Redlands Water Master Plan, February 2014; includes 'high' density demand factor calculated in Table 3-2, except as otherwise noted.

[2] Typical landscape ordinance restrictions per 2009 Water Conservation Act range from 1.0 to 2.0 AF/Ac/Yr.

[3] Represents demand on City of Redlands' domestic water system until non-domestic sources become available to the Project site.

[4] Represents demand that could be served by non-domestic water sources.

[5] Redlands water utility staff provided consumption data for water service accounts that served the Project site in the recent past.

[6] Existing building square-footage to project site acreage is ~0.4, which does not warrant use of high density demand factor.

The net increase in water demand for the Project site due to the proposed development is 223 AFY minus the estimated existing site demand of 25 AFY, or 198 AFY. The net increase represents the resulting impact on City water supplies. In addition, the City has designated the SSV project for recycled water service and will have recycled water available for the Project.

The SSV project applicant has provided an estimated construction schedule which indicates SSV buildout is planned for Year 2026. Absorption rates are proposed to include Buildings B1, B2, B3, and B5 for buildout in in Year 2024, and Buildings B4A and B4B for buildout in Year 2026. This phasing of development construction is evaluated in Section 4 to show the potential impacts Project demands may have on planned future water supplies. **Table 3-3b** summarizes the phased water usage for State Street Village.

Table 3-3b: State Street Village Estimated Water Demand Phasing, AF

Building	Class	Quantity	2021	2022	2023	2024	2025	2026	2027
B1	MF Residential	368,799 sf	0	28.8	57.5	86.3	86.3	86.3	86.3
	Comm Office	0 sf	0	0.0	0.0	0.0	0.0	0.0	0.0
	Comm Retail	14,839 sf	0	1.2	2.3	3.5	3.5	3.5	3.5
B2	MF Residential	132,896 sf	0	10.4	20.7	31.1	31.1	31.1	31.1
	Comm Office	12,222 sf	0	1.0	1.9	2.9	2.9	2.9	2.9
	Comm Retail	34,793 sf	0	2.7	5.4	8.1	8.1	8.1	8.1
B3	MF Residential	25,564 sf	0	2.0	4.0	6.0	6.0	6.0	6.0
	Comm Office	0 sf	0	0.0	0.0	0.0	0.0	0.0	0.0
	Comm Retail	0 sf	0	0.0	0.0	0.0	0.0	0.0	0.0
B4A	MF Residential	111,600 sf	0	5.2	10.5	15.7	20.9	26.1	26.1
	Comm Office	0 sf	0	0.0	0.0	0.0	0.0	0.0	0.0
	Comm Retail	10,743 sf	0	0.5	1.0	1.5	2.0	2.5	2.5
B4B	MF Residential	109,408 sf	0	5.1	10.2	15.4	20.5	25.6	25.6
	Comm Office	0 sf	0	0.0	0.0	0.0	0.0	0.0	0.0
	Comm Retail	10,381 sf	0	0.5	1.0	1.5	1.9	2.4	2.4
B5	MF Residential	0 sf	0	0.0	0.0	0.0	0.0	0.0	0.0
	Comm Office	0 sf	0	0.0	0.0	0.0	0.0	0.0	0.0
	Comm Retail	14,500 sf	0	1.1	2.3	3.4	3.4	3.4	3.4
	Total	**845,745 sf**	**0**	**58.4**	**116.8**	**175.2**	**186.6**	**197.9**	**197.9**
SSV Total	*MF Residential*	*748,267 sf*	*0*	*51.5*	*102.9*	*154.4*	*164.7*	*175.1*	*175.1*
	Commercial	*97,478 sf*	*0*	*6.9*	*13.9*	*20.8*	*21.8*	*22.8*	*22.8*
	Total	***845,745 sf***	***0***	***58.4***	***116.8***	***175.2***	***186.6***	***197.9***	***197.9***

4.0 REDLANDS WATER DEMAND

4.1 Overview

Southern California's urban water demand has reduced significantly on a per-capita basis largely due to the mandates from the Water Conservation Act, and 2014 and 2015 water reduction proclamations. These laws required all of California's retail urban water suppliers serving more than 3,000 acre-feet per year (AFY) or 3,000 service connections to achieve between 20 and 35 percent per-capita reduction from 2013 water consumption levels. Redlands has participated in SBVMWD water use reduction programs through the former CUWCC, and is continuing those efforts through the State Water Board. Redlands met their target goals and is in good standing for maintaining eligibility for State programs that offer grants and loans for critical water projects.

4.2 Factors Affecting Demand

Water demand within the Redlands service area is dependent on many factors such as local climate conditions and the evolving hydrology of the region. Demographics, land use characteristics, and economics are also key factors affecting the City's water demands. In addition to local factors, the watersheds of California's imported water supply continue to experience drought conditions which may continue to be a significant impact on future water supplies.

4.2.1 Climate Characteristics

The climate in the San Bernardino Valley is characterized by relatively hot, dry summers and cool winters with intermittent precipitation. The largest portion (73 percent) of average annual precipitation occurs during December through March, and rainless periods of several months are common in the summer. Precipitation is nearly always in the form of rain in the lower elevations and mostly in the form of snow above 6,000 feet elevation in the San Bernardino Mountains.

Mean annual precipitation ranges from approximately 10 inches near Riverside to approximately 30 inches in the upper San Bernardino Mountains. The historical record indicates that a period of above- average or below-average precipitation can last more than 30 years, such as the dry period that extended from 1947 to 1977. The region has been experiencing an ongoing drought since about 1999.

Three types of storms produce precipitation in the Santa Ana River Basin: general winter storms, local storms, and general summer storms. General winter storms usually occur from December through March. They originate over the Pacific Ocean as a result of the interaction between polar Pacific and tropical Pacific air masses and move eastward over the basin. These storms, which often last for several days, reflect orographic (i.e., land elevation) influences and are accompanied by widespread precipitation in the form of rain and, at higher elevations, snow. Local storms cover small areas, but can result in high intensity precipitation for durations of approximately six hours. These storms can occur any time of the year, either as isolated events or as part of a general storm, and those occurring during the winter are generally associated with frontal systems (a "front" is the interface between air masses of different temperatures or densities). General summer storms are rare but can occur in the late summer and early fall months in the San Bernardino area. **Table 4-1** shows average monthly climate data for the mountains and valley areas in the region.

Table 4-1 Climatological Data

Month	Mountain[1]			Valley[2]		
	Average Temperature (°F)	Average Precipitation (in.)	Average Standard ETo (in.)	Average Temperature (°F)	Average Precipitation (in.)	Average Standard ETo (in.)
January	34.1	4.49	1.94	52.4	3.22	2.53
February	35.2	4.09	2.39	54.6	3.25	2.87
March	38.0	3.06	4.03	56.7	2.86	4.30
April	43.0	1.32	5.22	60.9	1.29	5.38
May	50.7	0.48	6.67	65.6	0.47	5.82
June	58.4	0.14	7.06	71.3	0.09	6.76
July	64.2	0.74	6.44	77.7	0.04	7.38
August	63.3	0.97	5.92	77.7	0.15	7.09
September	57.5	0.53	4.80	73.9	0.33	5.51
October	48.8	0.82	3.67	66.5	0.71	3.97
November	39.9	2.00	2.27	58.6	1.32	2.89
December	34.0	3.21	1.60	53.3	2.38	2.38
Total		21.85	52.01		16.11	56.88

Notes: [1]Mountain precipitation and temperature for NOAA weather station 040741 in Big Bear Lake; data from 1960 through 2015; http://wrcc.dri.edu; ETo data for CIMIS weather station 199 in Big Bear Lake; http://wwwcimis.water.ca.gov/

[2]Valley precipitation and temperature for NOAA weather station 047723 in San Bernardino; data from 1893 through 2004; http//wrcc.dri.edu; ETo data for CIMIS weather station 44 at University of California, Riverside; http://wwwcimis.water.ca.gov/

4.2.2 Potential Effects of Global Climate Change

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. The Upper Santa Ana River (SAR) Watershed Integrated Regional Water Management Plan (IRWMP) included an assessment of the potential impacts of climate change. Recent climate change modeling for the SAR watershed suggests that a changing climate will increase average temperatures and decrease precipitation as snow, each of which could negatively impact the availability of water supplies in the future, and adaptation and mitigation measures will be necessary to account for these effects.

The forest ecosystems in the San Bernardino National Forest are currently on the decline. Alpine and subalpine forests are anticipated to decrease in the area by fifty to seventy percent by 2100. It is believed that increased greenhouse gas emissions are a primary factor contributing to the decline of these fragile ecosystems.

While high elevation ecosystems decline, the severity of future floods is likely to increase. The likelihood of a 200-year storm event or longer is anticipated to be significantly higher in 2070. This increases the potential for negative impacts on nearby infrastructure. Furthermore, storms are expected to be more severe but less frequent. Despite these assumptions, the aftermath of a severe

storm is highly variable.

In addition to changes in ecosystems and storm severity, warmer temperatures may also decrease the annual amount of snowfall and increase the instance of rain in higher elevations. This alteration of precipitation type is likely to cause negative impacts for snow-related recreational activities characteristic of the area's ski resorts. From a local standpoint, Big Bear and Snow Valley both lie below 3000 meters above MSL and are anticipated to experience a decline in snowpack by 2070. Furthermore, it is projected that there will be a decrease in overall winter precipitation of the area by 2070. On a larger scale, the increased temperatures could affect the Sierra Nevada Mountains in a similar way, threatening the reliability of water supplies from the State Water Project.

4.3 Demographics

Southern California Association of Governments (SCAG) developed a population forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. Estimated 2020 and future year population for the City of Redlands is shown in **Table 4-2**.

Table 4-2: Current and Projected Population

Population Served	2020	2025	2030	2035	2040	2045
TOTAL	**78,052**	**81,367**	**84,822**	**88,424**	**91,727**	**95,153**

Source: Table 4-1, City of Redlands chapter of the IRUWMP (July 2021).

4.4 Land Use

Per the 2017 City of Redlands General Plan, the following is the land use area breakdown for the City:

- 27% Single Family Residential
- 3% Multi-family residential
- 3% Commercial
- 5% Industrial
- 4% Public and Institutional facilities
- 16% Parks and Open Space
- 4% Agricultural
- 5% other uses including the Redlands Municipal Airport, utilities facilities, and public parking lots
- Remainder is made up of vacant land and public and private rights of way (railroads and private roads)

4.5 Water Use

4.5.1 Potable versus Non-Potable Water Use

In addition to serving potable water for domestic use, Redlands provides non-potable groundwater and recycled water to customers in its service area for irrigation, industrial, and other non-potable uses. Recycled water from the City of Redlands Wastewater Treatment Plant (WWTP) is used by the Mountain View Power Plant and a landfill. Recycled water that is not discharged or used by those

two customers is mixed with non-potable water from wells and is delivered to customers served by Redlands' non-potable system. This water is billed as "raw water" in Redlands' billing system. Redlands also maintains other separate non-potable systems that are supplied exclusively by non-potable groundwater and raw surface water.

4.5.2 Water Use by Sector

Redlands water users are classified as follows: Single Family, Multi-Family, Commercial/ Institutional, Landscape, Agricultural Irrigation, and Other, which includes fire suppression, construction water, and bulk water sales. Redlands also delivers non-potable water to three customer classes: Commercial/Institutional, Landscape, and Agricultural/Landscape Irrigation, and delivers recycled water to Mountain View Power Plant and a landfill. The active connections in each category from 2016 to 2020 are shown in **Table 4-3:**

Table 4-3: Redlands 2016-2020 Connections by Customer Class

Customer Class	2016	2017	2018	2019	2020
Single Family	19,515	19,526	19,532	19,473	19,922
Multi-Family	966	962	961	952	980
Commercial/ Institutional	1,357	1,375	1,373	1,363	1,397
Landscape	527	521	525	528	533
Agricultural Irrigation	34	35	30	32	17
Other	633	650	658	672	696
Commercial/ Institutional – Raw	8	9	10	10	11
Landscape – Raw1	111	121	124	124	135
Agricultural Irrigation – Raw	13	9	10	5	3
Subtotal Potable and Raw	*23,164*	*23,208*	*23,223*	*23,158*	*23,692*
Recycled Water[1]	2	2	2	2	2
TOTAL CONNECTIONS	**23,166**	**23,210**	**23,225**	**23,160**	**23,694**

Source: Table 4-2, City of Redlands chapter of the IRUWMP (July 2021).

[1] Recycled Water connections only include the Mountain View Power Plant and a landfill. Some Raw Landscape connections are served a blend of raw and recycled water.

The City of Redlands' actual water use by customer class from 2016-2020 is shown in **Table 4-4**. Approximately 94 percent of Redlands deliveries are potable water. Of potable deliveries, approximately 61 percent are to single family connections, 14 percent to multi-family connections, 12 percent to commercial and institutional connections, and the remainder for irrigation.

Table 4-4: Redlands 2016-2020 Water Use by Customer Class (AFY)

Customer Class	2016	2017	2018	2019	2020
Single Family	11,340	12,275	12,866	11,624	12,949
Multi-Family	2,835	2,913	2,934	2,750	2,901
Commercial/ Institutional	3,180	3,142	3,159	2,705	2,640
Landscape	1,924	2,155	2,340	2,228	2,220
Agricultural Irrigation	556	387	326	283	276
Other	183	253	179	174	151
Commercial/Institutional	102	175	175	167	158
Landscape	1,259	1,311	1,405	1,096	1,267
Agricultural Irrigation	47	33	16	6	4
Water Losses	901	2,177	1,639	2,211	3,327
Subtotal Potable and Raw	**22,327**	**24,822**	**25,038**	**23,244**	**25,892**
Recycled Water – Direct [1]	1,866	1,448	878	680	994
TOTAL DEMAND	**26,537**	**26,270**	**25,916**	**23,924**	**26,866**

Source: Table 4-3, City of Redlands chapter of the IRUWMP (July, 2021).
[1] Recycled Water – Direct demand only includes deliveries made to the Mountain View Power Plant and landfill recycled water connections. Other recycled water use is included in the blended non-potable water served as Landscape – Raw water.

4.6 SBX7-7 Baseline and Targets

The Water Conservation Act of 2009 required the State of California to reduce urban per capita water use by 20 percent by 2020. Each water agency was required to establish per-capita water use targets for 2015 and 2020.

Redlands' baseline and 2020 target were calculated in the 2015 Regional Urban Water Management Plan and was not changed for the 2020 plan. Redlands' calculated water use target for 2020 is 285 gpcd. Through the implementation of its active water conservation program, Redlands met this target as shown in **Table 4-5**. To maintain this level of water use, Redlands intends to continue its current level of outreach and water use efficiency programs for the foreseeable future.

Table 4-5: SBX 7-7 2020 Compliance

2020 Water Use Target GPCD	Actual 2020 GPCD	Supplier Achieved Target Reduction for 2020?
285	279	Yes

Source: Table 4-7, City of Redlands chapter of the IRUWMP (July 2021).

4.7 Projected Water Use

The demand factors for each customer class were based on connection and demand data from

calendar year 2020, which was reviewed against demand factors from other years and determined to be a reasonable representation of average demands. The number of future new connections for each customer category was estimated for each 5-year period through 2045 based on the projected SCAG population growth rate for years 2020-2035 and 2035-2045.

To estimate future water use for each customer category, the demand factor is multiplied by the number of estimated new connections and added to the 2020 use of existing customers in that category. This process is applied to each customer type for a breakdown of the estimated future water use. Redlands anticipates that future commercial/institutional connections will be dual-plumbed with both a potable service for indoor demands and non-potable service for outdoor demands. Both potable and raw commercial/institutional demands were adjusted to reflect this. Additionally, recycled water demand at the Mountain View Power Plant and landfill were assumed to be equal to their average annual consumption from 2016 to 2020. Projected water demands by customer class are summarized in **Table 4-6a** is taken from the Redlands 2020 UWMP.

Table 4-6a: Redlands Projected Water Demands (AFY)

CUSTOMER CLASS	2025	2030	2035	2040	2045
Single Family	12,943	13,470	13,997	14,461	14,925
Multi-Family	3,036	3,160	3,284	3,393	3,501
Commercial/ Institutional	3,081	3,145	3,209	3,265	3,321
Landscape	2,292	2,385	2,478	2,560	2,643
Agricultural Irrigation	206	206	206	206	206
Other	206	214	223	230	238
Commercial/ Institutional - Raw	248	319	391	454	517
Landscape - Raw	1,451	1,510	1,569	1,621	1,673
Agricultural Irrigation - Raw	9	9	9	9	9
Water Losses	2,347	2,442	2,537	2,620	2,703
Subtotal Potable and Raw:	*25,818*	*26,860*	*27,902*	*28,818*	*29,735*
Recycled Water Demand	1,173	1,173	1,173	1,173	1,173
TOTAL	**26,991**	**28,033**	**29,075**	**29,991**	**30,908**

Source: Tables 4-5 and 4-6, City of Redlands chapter of the IRUWMP (July 2021).

As discussed in Section 3, the SSV project applicant has provided an estimated construction schedule based on SSV buildout in Year 2026. **Table 4-6b** interpolates the City's UWMP projection demands by year and by customer classification for future years and shows multi-family residential and

commercial land uses of State Street Village compared to 2020 UWMP demand projections.

Table 4-6b: State Street Village and Redlands Projected Water Demands (AFY) [1]

						2025		2026		2027					
CUSTOMER CLASS	2020	2021[2]	2022[2]	2023[2]	2024[2]		UWMP increase from 2020		UWMP increase from 2020		UWMP increase from 2020	2030	2035	2040	2045
Single Family	12,949	12,948	12,947	12,945	12,944	12,943	-6	13,048	99	13,154	205	13,470	13,997	14,461	14,925
SSV	-	-	-	-	-	-		-		-		-	-	-	-
Multi-Family	2,901	2,928	2,955	2,982	3,009	3,036	***135***	3,061	***160***	3,086	***185***	3,160	3,284	3,393	3,501
SSV	0	0	51	103	154	***165***	-	***175***	-	***175***	-	-	-	-	-
Commercial/ Institutional	2,640	2,728	2,816	2,905	2,993	3,081	***441***	3,094	***454***	3,107	***467***	3,145	3,209	3,265	3,321
SSV	0	0	7	14	21	***22***	-	***23***	-	***23***	-	-	-	-	-
Landscape	2,220	2,234	2,249	2,263	2,278	2,292	72	2,311	91	2,329	109	2,385	2,478	2,560	2,643
SSV	-	-	-	-	-	-		-		-		-	-	-	-
Agricultural Irrigation	276	262	248	234	220	206	-70	206	-70	206	-70	206	206	206	206
SSV	-	-	-	-	-	-		-		-		-	-	-	-
Other	151	162	173	184	195	206	55	208	57	209	58	214	223	230	238
SSV	-	-	-	-	-	-		-		-		-	-	-	-
Commercial/ Institutional - Raw	158	176	194	212	230	248	90	262	104	276	118	319	391	454	517
SSV	-	-	-	-	-	-		-		-		-	-	-	-
Landscape - Raw	1,267	1,304	1,341	1,377	1,414	1,451	184	1,463	196	1,475	208	1,510	1,569	1,621	1,673
SSV	-	-	-	-	-	-		-		-		-	-	-	-
Agricultural Irrigation - Raw	4	5	6	7	8	9	5	9	5	9	5	9	9	9	9
SSV	-	-	-	-	-	-		-		-					
Water Losses	3,327	3,131	2,935	2,739	2,543	2,347	0 [3]	2,366	0 [3]	2,385	0 [3]	2,442	2,537	2,620	2,703
Total Potable/Raw Water	**25,892**	**25,878**	**25,863**	**25,849**	**25,834**	***25,818***	***906***	***26,026***	***1,095***	***26,235***	***1,284***	***26,860***	***27,902***	***28,818***	***29,735***
SSV Total [1]	***0***	***0***	***58***	***117***	***175***	***187***	-	***198***	-	***198***	-	-	-	-	-

[1] Conservatively assumes 100% of SSV demand will be supplied by potable water.

[2] Based on Redlands 2020 UWMP draft chapter (May 27, 2021), Tables 4-3 and 4-5; interpolated between Year 2020 and Year 2025.

[3] Redlands 2020 UWMP projects water loss will decrease from current through Year 2025, and remain less current through Year 2027.

Although SSV demand slightly exceeds the City's multi-family residential demand component for each year of project construction, the SSV project demand is significantly less than the City's overall demand projections. The Project's demands are approximately 18 percent of the City's overall increased demands at year of buildout (2026).

4.8 Water Loss Control

Since 2007 the City has replaced approximately 71 miles of pipeline in order to maintain reliability of the distribution system. However, in years prior, the City did not keep pace with pipe replacement program, resulting in a backlog of aged pipe that required extensive maintenance and repair. As a result of the aggressive water pipeline replacement program, water main leaks have reduced from 600 leaks to less than 200 per year. Additionally, the recent requirement to conduct annual water loss audits has resulted in the City's ability to identify areas needing improvement and develop plans to further reduce water loss.

5.0 REDLANDS WATER SUPPLY

Redlands' water supply is comprised primarily of surface water from the Santa Ana River (SAR) and Mill Creek and supplemented by groundwater extracted from the Bunker Hill Basin (part of the San Bernardino Basin) and Yucaipa Basin and a small amount of imported water when needed.

5.1 Purchased or Imported Water

Imported water from the State Water Project (SWP) is available for the City to purchase from Valley District when needed. The City has purchased supplemental SWP water only in years when surface water flows have not been able to meet demands and on occasion when surface water supplies are turbid and require blending or for other operational purposes. The City will continue to request SWP water in these situations; however, during SWP outages or extended dry periods the City will prioritize use from other sources.

If SWP water is not available in a future year, the City will shift to increase groundwater production and may implement conservation measures to reduce demands if needed. The City contributes to regional efforts to recharge the Bunker Hill groundwater basin with SWP water and local surface water in wet years when available so that storage is available for use in dry years when other supplies may be limited.

5.2 Groundwater

Redlands extracts groundwater from the Bunker Hill Subbasin of the San Bernardino Basin (SBB) and Yucaipa Subbasin. Redlands' historical production for the past five years is shown in **Table 5-1**. Extractions shown include both potable and non-potable water.

Table 5-1: Groundwater Volume Pumped, AF

TYPE	BASIN	2016	2017	2018	2019	2020
Alluvial Basin	Bunker Hill (part of SBB)	11,442	13,512	14,466	11,434	13,619
Alluvial Basin	Yucaipa	59	16	20	246	297
	Total	**11,501**	**13,527**	**14,485**	**11,680**	**13,916**

Source: Table 4-8, City of Redlands chapter of the IRUWMP (July 2021).

5.3 Surface Water

The City receives its surface water from the Mill Creek Watershed and the Santa Ana River Watershed. Surface water is treated at the Henry Tate Surface Water Treatment Plant (SWTP) and the Horace P. Hinckley SWTP.

The City has ownership in private and mutual water companies to supply water to the City's SWTPs. For decades the City has increased its ownership in these companies in an effort to increase its access to a reliable local source of water. Average surface water totals approximately 38 percent of the City's annual water production for the last several years. The City of Redlands sometimes supplements surface water supplies with SWP water, which is treated at the SWTP and

distributed for potable use.

5.4 Stormwater

Redlands is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the basins the City relies upon.

5.5 Wastewater and Recycled Water

The City is a sewering agency that treats approximately 5.9 million gallons of wastewater daily. The City's Wastewater Treatment Plant (WWTP) has the total capacity to treat 9.0 million gallons per day (MGD), up to 7.2 MGD of which can be treated to the tertiary level for Title 22 compliance.

Treated wastewater distributed to City customers is tertiary effluent treated to Title 22 compliance. The City's recycled water customers include Southern California Edison (SCE) Company, a landfill and recycled/non-potable water customers. SCE uses recycled water as cooling water at its Mountain View Power Plant and recycled/non-potable water customers use recycled water for irrigation when supply is available. All remaining wastewater is treated to a secondary level and released into spreading basins located east of the WWTP for recharge back into Bunker Hill basin. In 2020, approximately 1.6 MGD of treated wastewater was used as recycled water supply for customers, and 3.4 MGD was used for recharge.

5.6 Exchanges, Transfers and Interties

Redlands exchanges water with Valley District and other local water agencies through various agreements. The City operates two interconnections – one with Western Heights Water Company and the other with the City of Loma Linda. In addition, Redlands water utility is in the process of updating its Water and Recycled Water Master Plans to identify needed distribution system upgrades as well as increase the reliability of its current water supplies.

A summary of the current and projected supply sources and their documented utilization for the City of Redlands is shown in **Tables 5-2 and 5-3**. The normal year comparison of City demand versus supply is shown in **Table 5-4**.

Table 5-2: Actual Water Supplies in 2020 (AFY)

Water Supply	Additional Detail on Water Supply	Actual Volume	Water Quality	Total Right or Safe Yield
Groundwater (not desalinated)	Bunker Hill (part of SBB)	12,088	Drinking Water	
Groundwater (not desalinated)	Bunker Hill (part of SBB)	1,531	Other Non-Potable Water	
Groundwater (not desalinated)	Yucaipa	297	Other Non-Potable Water	
Surface water (not desalinated)	Santa Ana River (part of SBB)	5,796	Drinking Water	
Surface Water (not desalinated)	Mill Creek (part of SBB)	6,045	Drinking Water	
Purchased or Imported Water	SWP - Direct Deliveries	535	Drinking Water	
Recycled Water	Recycled Water - Direct	1,806	Recycled Water	
TOTAL:		**28,098**		

Source: Table 4-11, City of Redlands chapter of the IRUWMP (July 2021).

Table 5-3: Projected Water Supplies (AFY)

Water Supply	Additional Detail on Water Supply	Projected Water Supply				
		2025	2030	2035	2040	2045
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Groundwater (not desalinated)	Bunker Hill (part of SBB)	12,973	13,922	14,861	15,677	16,484
Groundwater (not desalinated)	Bunker Hill (part of SBB)	3,766	4,015	4,275	4,513	4,760
Groundwater (not desalinated)	Yucaipa	1000	1000	1000	1000	1000
Surface water (not desalinated)	Santa Ana River (part of SBB)	5,000	5,000	5,000	5,000	5,000
Surface Water (not desalinated)	Mill Creek (part of SBB)	5,500	5,500	5,500	5,500	5,500
Purchased or Imported Water	SWP - Direct Deliveries	700	700	700	700	700
Recycled Water	Recycled Water - Direct	2,100	2,100	2,100	2,100	2,100
TOTAL:		**31,039**	**32,237**	**33,436**	**34,490**	**35,544**

Source: Table 4-12, City of Redlands chapter of the IRUWMP (July 2021).

Table 5-4: Normal Year Supply and Demand Comparison (AFY)

	2025	2030	2035	2040	2045
Supply Totals	31,039	32,238	33,436	34,490	35,544
Demand Totals	26,991	28,033	29,075	29,991	30,908
Surplus	4,048	4,205	4,361	4,499	4,636
SSV Demands	187	198	198	198	198

Based on Table 4-13, City of Redlands chapter of the IRUWMP (July 2021).

5.7 Drought Risk Assessment

Drought Risk Assessment (DRA) was performed for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because Redlands has access to groundwater basins with significant storage, total available supplies do not vary on a monthly or seasonal basis, therefore the analysis was conducted on an annual basis. Projected demands, supplies, and use reduction and supply augmentation adjustments from 2021-2025 are shown in **Table 5-5**.

Table 5-5: Drought Risk Assessment (AFY) [1]

	2021	2022	2023	2024	2025
Gross Potable Water Use	28,466	28,450	28,433	28,417	28,400
Total Potable Water Supply [2]	32,864	32,891	32,917	32,944	32,970
Surplus	4,398	4,441	4,484	4,527	4,570
State Street Village	**0**	***58***	***117***	***175***	***187***

[1] Total Supply from Redlands 2020 UWMP chapter of the IRUWMP (July 2021) Table 4-17, minus recycled water supply.
[2] Excludes 1,173 recycled water supply (Table 4-6a herein) for conservative assessment of potable water supply.

The City's demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10 percent to reflect higher anticipated demands during dry years, as described in Section 6. Redlands can produce additional groundwater to meet increases in demand in dry years.

6.0 WATER SUPPLY RELIABILITY

The supply reliability assessment identifies the factors from the UWMP that could potentially limit the expected quantity of water available from Redlands' current source of supply through 2045, under normal years, single-dry years, and multiple dry years up to five consecutive years.

The 2020 UWMP identifies regular monitoring of groundwater contaminants to meet the Environmental Protection Agency and State Water Resources Control Board- Division of Drinking Water's regulatory requirements due to the industrial and commercial uses within the watershed. Based on the results, increased monitoring or treatment may be necessary if resources are impaired in order to meet all drinking water standards.

The UWMP recognizes that groundwater is no less vulnerable to seasonal and climatic changes than surface water (i.e., local and imported) supplies. The Western-San Bernardino Watermaster, in collaboration with the Basin Technical Advisory Committee (BTAC), monitor groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources.

The normal year supply and demand comparison is outlined in Table 5-4 of the previous section. Under single dry and extended multiple drought year (5 years) conditions for the 2020 UWMP, the water supply reliability assessment assumes that demands will increase by as much as 10 percent due to increased outdoor water use. Although water use may decrease in the later years of a multiple year drought due to implementation of conservation measures and drought messaging, the assessment is based on a 10 percent increase throughout the 5-year drought to be conservative.

The effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. If surface water flows and SWP supplies are reduced in dry years, the City will shift to increase groundwater production in Bunker Hill and increase conservation measures to reduce demands if needed. The City contributes to regional efforts to recharge the Bunker Hill groundwater basin with SWP water and local surface water in wet years when available so that storage is available for use in dry years. As a result, the City's total supplies are not reduced in dry years so 2020 is considered the base year for all year types. Based on the analysis, Redlands does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, Redlands participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources.

The City implements a water shortage contingency plan (WSCP) to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies. The WSCP is a strategic plan that Redlands uses to prepare for and respond to foreseeable and unforeseeable water shortages. A water shortage occurs when water supply available is insufficient to meet the normally expected customer water use at a given point in time. A shortage may occur due to water quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that

water suppliers reduce demands, as occurred in 2014. The WSCP serves as the operating manual that Redlands will use to prevent catastrophic service disruptions through proactive, rather than reactive, mitigation of water shortages. The WSCP provides a process for an annual water supply and demand assessment and structured steps designed to respond to actual conditions. The level of detailed planning and preparation provide accountability and predictability and will help Redlands maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

A summary of the basis of water year data is presented in **Table 6-1**. The percent of average supply increases in drought years because Redlands' groundwater production will increase to meet an assumed increase in demands.

Table 6-1: Available Supply if Year Type Repeats

Year Type	Base Year	Percent of Average Supply
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

Source: Table 4-14, City of Redlands chapter of the IRUWMP (July 2021).

The projected supply and demand during a single dry year are shown in **Table 6-2**. Redlands' demands in single dry years are assumed to increase by 10 percent above normal year demands. The local groundwater basins Redlands produces water from have storage for use in dry years allowing Redlands to produce the volume of water needed to meet all of its demands in single dry years. Redlands' supplies are 100 percent reliable during single dry years.

Table 6-2: Single Dry Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals	34,143	35,461	36,780	37,939	39,098
Demand Totals	29,690	30,836	31,982	32,990	33,998
Surplus	4,453	4,625	4,797	4,949	5,100
State Street Village Demand	***187***	***198***	***198***	***198***	***198***

Source: Table 4-15, City of Redlands chapter of the IRUWMP (July 2021).

The projected supply and demand during five consecutive dry years are shown in **Table 6-3**. Redlands' demands in multiple dry years are assumed to increase by 10 percent above normal year demands. The local groundwater basins Redlands produces water from have storage for use in dry

years giving Redlands the ability to produce the volume of water needed to meet all of its demands in single dry years. Redlands's supplies are 100 percent reliable during multiple dry years.

Table 6-3: Multiple Dry Years Supply and Demand Comparison

		2025	2030	2035	2040	2045
First	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
	Surplus	4,453	4,625	4,797	4,949	5,100
	SSV Demand	***187***	***198***	***198***	***198***	***198***
Second	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
	Surplus	4,453	4,625	4,797	4,949	5,100
	SSV Demand	***187***	***198***	***198***	***198***	***198***
Third	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
	Surplus	4,453	4,625	4,797	4,949	5,100
	SSV Demand	***187***	***198***	***198***	***198***	***198***
Fourth	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
	Surplus	4,453	4,625	4,797	4,949	5,100
	SSV Demand	***187***	***198***	***198***	***198***	***198***
Fifth	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
	Surplus	4,453	4,625	4,797	4,949	5,100
	SSV Demand	***187***	***198***	***198***	***198***	***198***

Source: Table 4-16, City of Redlands chapter of the IRUWMP (July 2021).

7.0 CONCLUSION

The City of Redlands water utility optimizes its water supplies through an integrated resource approach, utilizing available water programs and projects. Redlands receives its water from local surface and groundwater, treated wastewater, raw water, and purchased (imported) water.

The WSA includes a discussion of the Senate Bill 610 legislation, an overview of the State Street Village project, and analysis of existing and proposed water demands of the City of Redlands' customers over the UWMP planning horizon. The WSA also includes an analysis of reliability of Redlands' water supplies and concludes with a sufficiency analysis of water supply during normal, single-dry, and multiple dry years for the next 20 years.

The WSA does not evaluate the adequacy of the City's infrastructure to distribute the available water supplies nor does it make any recommendations with respect to capital improvements that may be necessary in order to provide an adequate level of service to proposed development projects.

Based on the City's 2020 UWMP, this WSA identifies a program of options to provide sufficient water supply for State Street Village both now and for the next 20 years.

The proposed SSV project includes changes to the land use of the existing 11.02-acre Redlands Mall site plus 1.17-acre parking lot south of Citrus Avenue from commercial retail and public parking to a mixed-use development of attached residential, and commercial office and retail. The change in land use results in a net annual increase of approximately 176,800 gallons per day, or 198 AFY. Recycled water will be supplied by the City to the Project for outdoor irrigation.

The City of Redlands obtains the vast majority of its supplies from local sources. Supplemental sources are called upon from its wholesaler, SBVMWD, and Metropolitan Water District of Southern California imported water entitlements only when needed.

The information included in this Water Supply Assessment identifies programs and activities that collectively represent reasonable opportunities to ensure an adequate supply of water for the City of Redlands, inclusive of the State Street Village development project now and 20 years into the future.