This section describes the regulatory setting, impacts associated with wastewater services, water services, and solid waste disposal that are likely to result from project implementation, and measures to reduce potential impacts to wastewater, water supplies and solid waste. A detailed discussion of the proposed project's storm drainage and flood control facilities is included in Section 3.9, Hydrology and Water Quality. Therefore, storm water drainage and infrastructure are not addressed in this EIR section. This section is based in part on the following documents, reports and studies:

- City of Davis General Plan (City of Davis May 2001, Amended through 2007),
- West Davis Active Adult SB 610 Water Supply Assessment (Tully & Young, 2017),
- Memorandum – Subject: West Davis Active Adult Community Land Use Changes (Tully & Young, 2017),
- City of Davis 2015 Urban Water Management Plan (City of Davis, 2016),
- City of Davis Final 2015 Urban Water Management Plan (City of Davis, 2016),
- Impacts of Innovation Center/Nishi Property Development on Wastewater Treatment Plant Capacity Technical Memorandum (West Yost, 2015),
- Impacts of Innovation Center/Nishi Property Development on Wastewater Collection System Capacity Technical Memorandum (West Yost, 2015),
- Wastewater Facilities Strategic Master Plan (City of Davis, 2005).

Comments were received during the public review period or scoping meeting for the Notice of Preparation regarding this topic from the following: Patrick S. Blacklock, County of Yolo (April 18, 2017), Toni Terhaar and Russ Kanz (April 26, 2017), Shanie Tadlock, Central Valley Regional Water Quality Control Board (May 8, 2017), Christine M. Crawford, Yolo Local Agency Formation Commission (May 11, 2017), and Eileen M. Samitz (May 13, 2017). Each of the comments related to this topic are addressed within this section.

3.15.1 WASTEWATER SERVICES

EXISTING SETTING

Wastewater Conveyance and Treatment

The project site is located along a main thoroughfare with fully developed utilities infrastructure. The City of Davis wastewater collection system conveys wastewater for the area within the city limits to the Wastewater Treatment Plant (WWTP), located at 45400 County Road 28H. The collection system includes 156 miles of sewer pipelines ranging in diameter from six inches to 66 inches. In addition, the City has six sewer lift stations within the service area to facilitate the flow of wastewater to the WWTP.[1]

The City also provides sewer collection services to El Macero and North Davis Meadows. The City has an agreement to provide the same level of service to the El Macero District as within the City.

[1] City of Davis. *Sewer System Management Plan.* August 2012.

The City service and obligation to North Davis Meadows is limited to repairing the low-pressure line. Yolo County provides North Davis Meadows pump station maintenance services.

The City of Davis was authorized by the California Regional Water Quality Board in October 2013 to discharge pursuant to Order R5-2007-0132-02 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0079049. The City of Davis submitted a Report of Waste Discharge, dated 4 April 2012, and applied for a NPDES permit renewal to discharge up to 7.5 MGD of treated wastewater from the City of Davis Wastewater Treatment Plant (WWTP). The Order will expire on November 1, 2018.

Under the Permit Order, the City has the ability to discharge treated wastewater from two different discharge points (Discharge Point Nos. 001 and 002). The treatment system for both discharge points consists of a mechanical bar screen, aerated grit tank, three primary sedimentation tanks, three facultative oxidation ponds, two aerated ponds, a polishing pond, an overland flow system, disinfection, and dechlorination. However, prior to the discharge at Discharge Point No. 002, the disinfected effluent passes through treatment wetlands. Each discharge point is located in a different receiving water. Treated wastewater is discharged from Discharge Point No. 001 to the Willow Slough Bypass, a water of the United States, and part of the Yolo Bypass flood protection structure within the Sacramento River Watershed. Treated wastewater is discharged from Discharge Point No. 002 to the Conaway Ranch Toe Drain, a water of the United States, and a part of the Yolo Bypass within the Sacramento River Watershed.

The City's WWTP was recently upgraded to ensure compliance with all existing and anticipated wastewater discharge standards. The treatment process upgrade was completed in October 2017.[2] The City's WWTP upgrade project included design and construction of improvements to the City's WWTP in order to meet State and Federal regulatory discharge requirements contained in the City's adopted 2013 National Pollutant Discharge Elimination System (NPDES) permit. The project was accomplished in two phases: Rehabilitation and Replacement (R&R) Phase and Secondary and Tertiary Improvements (STI) Phase.

The following secondary and tertiary WWTP improvements have been completed:

- Secondary replacement – new secondary biological treatment and clarification (replacing the ponds and overland flow treatment system with conventional activated sludge process);
- New tertiary (advanced treatment) – new filtration and coagulation facilities;
- Disinfection – upgrade existing disinfection;
- Incorporate ponds as equalization, redundancy for treatment systems, and future treatment capacity;
- New solids handling equipment and modifications to existing digesters; and

[2] Personal Communication with John Alexander, Plant Manager, City of Davis Public Works. December 4, 2017.

- New laboratory facility and modify existing operations and maintenance facilities.

The WWTP is sized to accommodate 6.0 mgd of average dry weather flow (ADWF). ADWF is defined as the average of the three consecutive lowest-flow calendar months, which for the City usually coincides with the period of July through September.

The 5-year average of ADWF values for the period of 2010 to 2014 is 4.34 mgd. The lowest ADWF value during that period was 3.78 mgd, measured in 2014, which is reflective of the strict water conservation measures implemented throughout the City during the severe 2014 drought conditions. This is supported by the fact that WWTP influent biochemical oxygen demand (BOD) concentrations were proportionally higher in 2014 versus previous years (A reverse correlation between WWTP influent flow and BOD concentration is expected). The calculated BOD loads in pounds per day (lbs/day) show less variability than either the flow or BOD concentrations during the same period due to the off-setting effect of the latter two parameters on each other.

Given the relatively high variability in ADWF measurements over the last five years, there is some question as to what actually represents the "current" ADWF value. Because the 2014 value was unusually low as compared to previous years, the use of the 2014 ADWF may be inappropriately low for assessing available WWTP capacity. On the other hand, the inclusion of the 2014 value in a 5-year average seems reasonable in calculating a sufficiently robust ADWF value, given the potential for drought-related water use reductions every few years.

Based on these considerations, the 5-year average ADWF value for the period of 2010 to 2014 (i.e., 4.34 mgd) is assumed to represent current ADWF conditions. Growth within the City has been minor over that span, so the flow-generating land uses within the City have remained relatively constant during that period. Given an existing ADWF of 4.34 mgd and a WWTP capacity of 6.0 mgd now that the STI phase of the WWTP upgrade project has been completed, West Yost has estimated that the available ADWF capacity of the WWTP is 1.66 mgd, or 28 percent of design capacity.[3]

Another way to assess remaining WWTP capacity involves consideration of BOD loadings rather than flows. The use of BOD loadings as an indicator of capacity is relevant because certain key treatment processes (namely secondary treatment facilities) are sized to handle organic loadings rather than flow. According to West Yost, the design average dry weather BOD loading is 10,100 lbs/day. It should be noted that sizing of secondary facilities is driven more by maximum month loadings rather than average loadings. However, it is generally assumed that the proportionality between average and maximum month BOD loadings remains constant over time, such that the use of average BOD loadings to assess available WWTP capacity remains valid.

Assuming the average BOD loading for the period of 2010 to 2014 represents current conditions (in a manner similar to the ADWF values for that same period), then the existing average dry weather WWTP influent BOD loading is 7,900 lbs/day. However, given the variability in the BOD

[3] West Yost Associates. *Impacts of Innovation Center/Nishi Property Development on Wastewater Treatment Plant Capacity [pg. 4]*. Technical Memorandum (Final). April 2, 2015.

loadings over the past five years, and given the variability inherent in influent BOD sampling, West Yost assumed a 5 percent safety factor when estimating existing BOD loadings. Therefore, the existing average dry weather WWTP influent BOD loading is assumed to be 8,300 lbs/day for this analysis. The use of this value implies that 1,800 lbs/day of average dry weather BOD loading are available for future development.

REGULATORY SETTING - WASTEWATER

Clean Water Act (CWA) / National Pollutant Discharge Elimination System (NPDES) Permits

The CWA is the cornerstone of water quality protection in the United States. The statute employs a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

The CWA regulates discharges from "non-point source" and traditional "point source" facilities, such as municipal sewage plants and industrial facilities. Section 402 of the Act creates the NPDES regulatory program which makes it illegal to discharge pollutants from a point source to the waters of the United States without a permit. Point sources must obtain a discharge permit from the proper authority (usually a state, sometimes EPA, a tribe, or a territory). NPDES permits cover industrial and municipal discharges, discharges from storm sewer systems in larger cities, storm water associated with numerous kinds of industrial activity, runoff from construction sites disturbing more than one acre, mining operations, and animal feedlots and aquaculture facilities above certain thresholds.

Permit requirements for treatment are expressed as end-of-pipe conditions. This set of numbers reflects levels of three key parameters: (1) biochemical oxygen demand (BOD), (2) total suspended solids (TSS), and (3) pH acid/base balance. These levels can be achieved by well-operated sewage plants employing "secondary" treatment. Primary treatment involves screening and settling, while secondary treatment uses biological treatment usually in the form of "activated sludge."

All so-called "indirect" dischargers are not required to obtain NPDES permits. An indirect discharger is one that sends its wastewater into a city sewer system, so it eventually goes to a sewage treatment plant. Although not regulated under NPDES, "indirect" discharges are covered by another CWA program called pretreatment. "Indirect" dischargers send their wastewater into a city sewer system, which carries it to the municipal sewage treatment plant, through which it passes before being discharged to surface water.

The City of Davis was authorized by the California Regional Water Quality Control Board pursuant to Order R5-2007-0132-02. The City's current NPDES Permit (NPDES No. CA0079049), which regulates the wastewater effluent quantity and quality upon discharge, was issued on October 25,

2007 and amended in February 2009 and September 2010, and again in October 2013. The NPDES permit is administered by the Regional Water Quality Control Board.

City of Davis Wastewater Facilities Strategic Master Plan

In 2005, the City of Davis prepared the Davis Wastewater Facilities Strategic Master Plan. The purpose of the Master Plan is to provide a strategic plan that outlines wastewater treatment, disposal, and reuse facility needs for a 25-year planning horizon. The Master Plan outlines the facilities needed and steps required to: 1) meet treatment requirements specified in the then active 2001 NPDES permit, 2) provide flexibility to meet anticipated future regulatory requirements, 3) determine repair and replacement needs for the facility, 4) improve reliability to ensure process performance, and 5) provide community benefits.

City of Davis General Plan

The City of Davis General Plan contains the following goal and policies that are relevant to wastewater aspects of the proposed project:

Goal WATER 5. Remain within the capacity of the City wastewater treatment plant.

Policy WATER 5.1. Evaluate the wastewater production of new large scale development prior to approval to ensure that it will fall within the capacity of the plant.

Policy WATER 5.2. Provided that the existing plant capacity is not exceeded, require new large scale development to pay its fair share of the cost of extending sewer service to the site.

THRESHOLDS OF SIGNIFICANCE - WASTEWATER

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment associated with Utilities if it will:

1. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

2. Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

3. Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

IMPACTS AND MITIGATION MEASURES

Impact 3.15-1: Wastewater generated by the proposed project may exceed the capacity of the wastewater treatment plant, and may exceed the wastewater treatment permit requirements (Less than Significant)

Wastewater generated at the project site would be conveyed to the City's WWTP for treatment and disposal. The on-site sewer system for the proposed project would consist of a system of sewer lines under local streets which would collect and convey wastewater flows generated from the proposed project to one or more points of connection.

Table 3.15-1 presents the projected sewer flows from the proposed project. The calculated flows were based on rates provided by City staff in an August 1, 2012 Utility Guidance Letter. The proposed project would generate 0.13 mgd average dry weather flow. The peak dry day flows generated by the project would be 0.29 mgd.

TABLE 3.15-1: PROJECT SEWER FLOWS

LAND USE	*UNITS OR SF OR ACREAGE*	*FLOW PER UNIT OR ACRE (GPD)*	*ADDF (GPD)*	*PF*	*PDDF (GPD)*
Single Family Residential	360 DU	230 / DU	82,800	2.147 * ADDF	177,772
Multi-Family Residential	200 DU	230 / DU	46,000	2.147 * ADDF	98,762
Health Club and Pool	3.0 Acres	1,500 / Acre	4,500	2.147 * ADDF	9,662
Mixed Use (Restaurant)	5,000 SF (0.11Acres)	2,500 / Acre	275	2.147 * ADDF	590
Total	**-**	**-**	**133,575 (0.13 mgd)**	**2.147 * ADDF**	**286,486 (0.29 mgd)**

NOTES:
1- PER CAPITA FLOW RATES WERE ESTABLISHED BY THE DAVIS PUBLIC WORKS DEPARTMENT AND PROVIDED IN AN AUGUST 1, 2012 UTILITY GUIDANCE LETTER
2- INFILTRATION AND INFLOW ALLOWANCE IS ASSUMED 600 GPD PER GROSS ACRE PER DAVIS PUBLIC WORKS DEPARTMENT AND PROVIDED IN AN AUGUST 1, 2012 UTILITY GUIDANCE LETTER.
3- ADDF = AVERAGE DAILY DRY WEATHER FLOW
4- PF = PEAKING FACTOR
5- I/I = INFILTRATION AND INFLOW (APPLIED ON GROSS ACREAGE BASIS). PARKS, OPEN SPACE, & ROW ARE EXEMPT.
6- PWWF = PEAK WET WEATHER FLOW = DESIGN FLOW FOR PIPES
SOURCE: CITY OF DAVIS PUBLIC WORKS DEPARTMENT. "UTILITY GUIDANCE LETTER", AUGUST 1, 2012.

The WWTP would be sized to accommodate 6.0 MGD of ADWF. ADWF is defined as the average of the three consecutive lowest-flow calendar months, which for the City usually coincides with the period of July through September. Now that the STI phase of the WWTP upgrade project has been completed, West Yost has estimated that the available ADWF capacity of the WWTP is 1.66 MGD, or 28 percent of design capacity[4].

[4] West Yost Associates. Impacts of Innovation Center/Nishi Property Development on Wastewater Collection System Capacity. Technical Memorandum. March 25, 2015.

According to West Yost Associates, an infiltration/inflow factor of 600 gallons per gross acre per day is appropriate (West Yost Associates, 2015). This factor is applied on a gross acreage basis, and parks, open space, and right-of-way are exempt. As shown in Table 2.0-1 in Section 2.0, Project Description, approximately 30.01 acres of the 74.49-acre site would be utilized for greenway, urban agriculture transition area, and public right-of way. Based on the resulting 44.48 acres, the project would result in infiltration and inflow flow of 26,688 gallons per day (gpd).

Buildout of the proposed project would result in the construction of up to 560 dwelling units generating up to approximately 1,467 additional residents (based on 2.62 persons per household). According to West Yost Associates, a wastewater generation factor of 230 gallons per day per unit of multi-family or single family residential development is appropriate (West Yost Associates, 2015). Based on the proposed 560 units, the residential portion of the project would result in a wastewater flow of 128,800 gallons per day (0.129 mgd). According to West Yost Associates, a wastewater generation factor of 230 gallons per day per unit of multi-family or single family residential development is appropriate (West Yost Associates, 2015). Based on the proposed 8,000 square foot health club and pool (located on 3.0 acres) and the 5,000 square foot fast casual restaurant, the non-residential portion of the project would result in a wastewater flow of 4,775 gallons per day (0.005 mgd). Therefore, as shown in the above table, the total wastewater flow from the project site would be about 0.13 MGD.

Therefore, the current capacity of the WWTP would be sufficient to handle the wastewater flow from the proposed project. In addition, the proposed project is required to pay sewer impact fees which would contribute towards the cost of future upgrades, when needed. As a result, the proposed project would not have adverse impacts to wastewater treatment capacity. Because the project applicant would pay City sewer impact fees, and adequate long-term wastewater treatment capacity is available to serve full build-out of the project, a ***less than significant*** impact would occur related to requiring or resulting in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

3.15.2 WATER SUPPLIES

EXISTING SETTING

Water Service Area

The City of Davis is located in the Central Valley in the southeastern corner of Yolo County and to the east of the coastal mountain range and San Francisco Bay Area, and 12 miles west of the state capital of Sacramento. It occupies an area of about 9.8 square miles (6,281 acres). Incorporation of the City occurred in 1917, and water service is provided to all residential (single and multi-family), commercial, industrial, and irrigation customers, and for open space and fire protection uses.

Water service within the City of Davis is provided to all residential (single and multi-family), commercial, industrial, institutional, and irrigation customers, as well as open space and fire protection uses. The City of Davis' water system service area coincides with the City's boundary, is

bordered by the University of California, Davis (UC Davis) campus to the south, and additionally includes the El Macero (located south of Interstate 80), Willowbank, and the Royal Oak Manufactured Home Community areas that are located outside of the City's boundary. The City's water system currently serves a 2014 population of approximately 68,000, which includes an estimated 1,383 people in the El Macero and Willowbank areas.

City of Davis Water Supplies

The proposed project, if approved by the City, is capable of being served by the City from the City's existing and future portfolio of water supplies. The project site already has access to City water pipes along the Covell Boulevard and Risling Court right-of-way (ROW). The water supply for the proposed project would have the same water supply reliability and water quality as the water supply available to each of the City's other existing and future water customers.

There are three primary water rights and contracts (collectively, "water supplies") that are used within the City's existing service area and Sphere of Influence (SOI). All three of these water supplies are used to meet the water demands for the City's residents. In several areas within the City, the water supplies can be interchanged and commingled for delivery to end users. The water supplies are:

- Woodland-Davis Clean Water Agency (WDCWA) State Water Resources Control Board (SWRCB) Appropriative Water Right Permit 20281;
- WDCWA's Central Valley Project (CVP) Contract No. 14-06-200-7422X-R-1; and
- City of Davis' groundwater rights.

Each of these water supplies are subject to a unique set of conditions based upon the terms of the underlying water rights, the regulatory environment, the contractual limitations, and the City's ability to access and deliver the supplies to meet targeted end-user needs. Within this structural framework, the City manages its water assets to meet its customers' demands. Importantly, the structural framework morphs and changes, requiring the City's water managers to adjust the water asset management and use.[5]

HISTORICAL POTABLE WATER SUPPLIES

The City's water supplies have historically included water supplies solely derived from its groundwater resources. In June of 2016, the City began using a new water diversion facility from the Sacramento River and began taking water supplies from WDCWA's surface water assets. The City's additional water sources will reduce its historical reliance upon groundwater and improve other water quality issues associated with utilization of groundwater resources. In normal years, the City anticipates relying upon WDCWA's surface water assets to meet the majority of the City's water demands. In dry years, the City anticipates using additional groundwater to meet demands that its surface water supplies are unable to meet. In short, the City is developing a robust

[5] The City may investigate additional water assets that may be included in its water supply portfolio, including surface diversions that would be banked in groundwater aquifers.

conjunctive use program in coordination with WDCWA that will allow it to optimally manage its surface and groundwater resources to serve its near-term and long-term demands.

The City generally only purchases and delivers water that is necessary to meet the City's customers' demands. Thus, although the WDCWA may have rights and entitlements to significant sources of water, the City only utilizes the amount it needs under those rights and entitlements. Tables 3-15-2 and 3.15-3 show the City's historical water supply deliveries.

TABLE 3.15-2: CITY OF DAVIS HISTORIC WATER SUPPLIES

YEAR	*GROUNDWATER (AFY)*	*YEAR*	*GROUNDWATER (AFY)*
1995	12,494	2006	14,333
1996	12,995	2007	14,762
1997	13,857	2008	14,219
1998	11,908	2009	12,835
1999	13,740	2010	11,957
2000	14,099	2011	11,531
2001	15,072	2012	12,218
2002	15,112	2013	12,338
2003	14,551	2014	10,901
2004	15,100	2015	9,211
2005	14,452	'95-'13 Average	13,556

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

TABLE 3.15-3: CITY OF DAVIS 2016 WATER SUPPLIES

MONTH	*GROUNDWATER (AFY)*	*PERMIT*	*CVP CONTRACT*
January	467	0	0
February	446	0	0
March	465	0	0
April	703	0	0
May	959	0	0
June	0	0	1,093
July	0	0	1,218
August	264	0	980
September	0	0	1,150
October	400	412	0
November	0	527	0
December	0	452	0
Totals	*3,704*	*1,391*	*4,400*

NOTE: THESE WATER SUPPLIES ARE DERIVED FROM THE AVAILABILITY OF VARIOUS ASSETS UNDER THE CITY'S RIGHTS AND CONTRACTS AS WELL AS RESCHEDULING OPPORTUNITIES ASSOCIATED WITH THE CVP SUPPLY. TOTAL WATER USE DERIVED FROM THE CITY'S MEASURED DEMANDS COUPLED WITH SUPPLY AVAILABILITY PRODUCED THE SUPPLY NUMBERS DEPICTED IN THIS TABLE.
SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

WOODLAND-DAVIS CLEAN WATER AGENCY

The WDCWA is a joint powers authority (JPA) established by the Cities of Woodland and Davis to develop a sustainable high-quality water supply. The cities signed the "Amended and Restated

Woodland-Davis Clean Water Agency Joint Powers Agreement" on February 26, 2013 that outlines the structure and governance of the JPA. This Agreement, coupled with the "Amended and Restated Woodland-Davis Clean Water Agency and University of California Agreement Concerning Potential Water Supply Contract", allocate water supplies, infrastructure costs, and operating issues among the participating agencies.

The WDCWA and Reclamation District 2035 constructed a new water intake on the Sacramento River to divert surface water supplies to the cities of Woodland and Davis in order to allow those cities to reduce their dependence on groundwater. The WDCWA holds water right permit 20281 and CVP contract 14-06-200-7422X-R-1 and allocates the water assets under those contracts pursuant to the above noted agreements. In short, the pertinent cost allocation and supply allocation under the agreements is as follows: 52.1% for the City of Woodland, 44.4% for the City of Davis, and 3.5% for UC Davis. The information in the following sections describes the key aspects of WDCWA's water assets that make up the wholesale water that is delivered to the City of Woodland, City of Davis, and UC Davis

SWRCB Appropriative Water Right Permit 20281

The WDCWA's appropriative water right Permit 20281 (Permit) provides the primary surface water supply for the City that the City's retail customers will use from the fall through spring each year, as that right is available. The Permit allows WDCWA to divert a maximum 80 cubic feet per second (cfs) of water at its diversion facility on the Sacramento River. WDCWA may divert a maximum volume each year of 45,000 acre-feet (AF). The Permit has a priority date of April 19, 1994 – rendering it a significantly junior water right on the Sacramento River watershed system. The WDCWA began diverting water under this Permit in 2016.

The Permit is subject to two important conditions: Term 20 and Term 25. Term 20 is a standard permit term that is contained in nearly all recently issued SWRCB Appropriative Water Right Permits. Term 20 is commonly referred to as "Term 91." Term 91 does not authorize water diversions under the Permit when "satisfaction of inbasin entitlements requires release of supplemental Project water by the Central Valley Project or the State Water Project." The "inbasin entitlements" include other water users, as well as needs of the environment. Thus, although the water right allows diversions of water all year, the actual diversion period is limited by the needs of other demands on the broader Sacramento-San Joaquin Bay Delta.

In 2015, Term 91 was in effect – which would have disallowed diversions under this Permit – from April 30 through November 2. In 2016, Term 91 was in effect from May 2 through October 14 limiting diversions under this Permit. To date, in 2017, Term 91 has not been declared and the WDCWA continues to divert water under the Permit to meet its local demands.

Term 25 is another important term in the WDCWA Appropriative Water Right Permit. Term 25 states, in relevant part, the following: "No water shall be diverted under this permit until Permittee obtains a long-term water supply covering those periods when water is not available for diversion pursuant to this permit." Accordingly, the WDCWA was unable to divert water under this Permit until it acquired a water supply that could be used when Term 91 was in effect or otherwise

"not available." The WDCWA acquired an additional water supply, noted below, in order to satisfy the Permit term.

WDCWA has recently initiated water diversions under its Permit. These diversions started on October 15, 2016 and have continued uninterrupted since that time. The water supplies have been delivered to the City of Davis through the terms of the applicable agreements. The supplies have resulted in reduced pumping from groundwater resources that have augmented groundwater supplies available to the City.

The total volume of water available under this Permit is divided proportionally pursuant to the allocation terms noted above. Thus, the total annual allowable water supply of 45,000 AF would be divided as follows: City of Woodland 23,445 AF, City of Davis 19,980 AF, and UC Davis 1,575 AF. Although these water supplies can be manipulated by the participating agencies, the maximum water available under the Permit to the City of Davis to meet its long-term demands was assumed to be 19,980 AF per year (AFY).

Central Valley Project Contract No. 14-06-200-7422X-R-1

The second surface water supply available to the City is based upon the terms and conditions contained in CVP Contract No. 14-06-200-7422X-R-1 issued to the WDCWA (Settlement Contract). The Settlement Contract is a settlement of water right claims against the United States when the United States acquired water rights and constructed the CVP. The "Settlement Contractors" essentially dismissed their claims against the United States in return for specific water supply contracts that generally promised water supply deliveries pursuant to the terms of underlying water rights.

The WDCWA was not an original Settlement Contractor. In 2010, however, the WDCWA purchased a portion of the underlying water rights from an existing Settlement Contractor and was assigned the protections of a Settlement Contract in an agreement with Conoway Preservation Group, LLC (CPG). The 2010 Agreement assigned a portion of CPG's water rights under Licenses 904 and 5487 to WDCWA. WDCWA now holds two water right licenses, Licenses 904A and 5487A, that make up the underlying water rights under the assigned Settlement Contract. License 904A has a priority date of March 1, 1919 and License 5487A has a priority date of September 8, 1947. The maximum volumes of water available collectively under these water right licenses is 10,000 AFY, even though License 904A has a maximum annual volume of 7,500 AFY and License 5487A has a maximum annual volume of 4,919 AFY (combined 12,419 AFY).

The Settlement Contract entitles WDCWA to a maximum of 10,000 AFY of water supplies from the Sacramento River. Article 5(c) notes, however, that in critical years the maximum water supply available will be only 7,500 AF. The contract entitles WDCWA to divert water from April through October. However, the Settlement Contract has some other specific terms that limit this open-ended diversion:

1. The WDCWA may schedule deliveries as follows "at no cost": June: 2,500 AF, July: 3,500 AF, August: 500 AF, and September: 3,500 AF.

2. The water may be made available under Article 3(c)(1) in other months "at additional cost".
3. Under Article 3(c)(2)(ii), the July August and September maximum annual diversion is 7,500 AF.

Accordingly, in light of the ability to move water assets around in various months, the majority of the water supplies available for use were assumed to be used in the no-cost months as noted in the Settlement Contract. If additional water is available for use that was not used in the "no cost months", then that water will be diverted as available in other months of the year. Water was initially diverted under this contract in June of 2015. Tables 3.15-4 and 3.15-5 represent the water supplies available under the Settlement Contract in accordance with the WDCWA's allocation system.

TABLE 3.15-4: WDCWA NORMAL YEAR SETTLEMENT CONTRACT ALLOCATION (10,000 AF AVAILABLE)

CONTRACTING ENTITY	*PERCENTAGE SUPPLY*	*ANNUAL ALLOCATION (AF)*
City of Woodland	52.1	5,210
City of Davis	44.4	4,440
UC Davis	3.5	350

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

TABLE 3.15-5: WDCWA NORMAL YEAR SETTLEMENT CONTRACT ALLOCATION (7,500 AF AVAILABLE)

CONTRACTING ENTITY	*PERCENTAGE SUPPLY*	*ANNUAL ALLOCATION (AF)*
City of Woodland	52.1	3,907.5
City of Davis	44.4	3,330
UC Davis	3.5	262.5

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

The City of Davis can allocate its portion of its water supply delivered from WDCWA into a monthly allocation. Thus, Tables 3.15-6 and 3.15-7 represents the City of Davis' monthly Settlement Contract allocation.

TABLE 3.15-6: CITY OF DAVIS NORMAL YEAR SETTLEMENT CONTRACT ALLOCATION (4,440 AF AVAILABLE)

MONTH	*PERCENTAGE SUPPLY BASED ON SETTLEMENT CONTRACT TERMS*	*MONTHLY ALLOCATION (AF)*
June	44.4	1,110
July	44.4	1,554
August	44.4	222
September	44.4	1,554

NOTE: ALTHOUGH THE SUPPLIES DEPICTED ARE DESIGNATED FOR THE MONTHS SHOWN, THE CITY MAY TAKE THE SUPPLIES IN OTHER MONTHS AS NEEDED, SUBJECT TO OTHER FEES AND CONDITIONS. ANY CHANGE DOES NOT ALTER TOTAL AVAILABLE SUPPLY.
SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

TABLE 3.15-7: CITY OF DAVIS NORMAL YEAR SETTLEMENT CONTRACT ALLOCATION (3,330 AF AVAILABLE)

MONTH	*PERCENTAGE SUPPLY BASED ON SETTLEMENT CONTRACT TERMS*	*MONTHLY ALLOCATION (AF)*
June	44.4	832.5
July	44.4	1,165.5
August	44.4	166.5
September	44.4	1,165.5

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

CITY GROUNDWATER SUPPLIES AND MANAGEMENT

The City of Davis has historically pumped groundwater from the Yolo Subbasin (Department of Water Resources [DWR] Bulletin 118 noted 5-21.67) which is part of the broader Sacramento Valley groundwater basin. The Subbasin is essentially bounded by the Coast Ranges in the west, Putah Creek in the south, Cache Creek in the north, and the Sacramento River on the east. The groundwater supplies within the Subbasin are shared by numerous agricultural and urban purveyors. The City has greatly reduced its reliance on groundwater to meet its needs since the development of the surface water supplies derived from the WDCWA. The development of these surface supplies has allowed the City to use groundwater only in instances where surface water assets are unavailable.

The aquifers in the Davis area are recharged from rainfall, applied irrigation water, streambed recharge, irrigation channel recharge, and water moving through the Yolo Bypass. Putah Creek and Cache Creek provide substantial stream channel infiltration.

The City's groundwater supply is provided by 12 active wells, as shown in Table 3.15-8. These wells are located in both the "intermediate aquifer" and the "deep aquifer." The "intermediate aquifer" begins at about 200 feet below the ground surface and the "deep aquifer" begins at about 700 feet below the ground surface. The deep aquifer's water chemistry has lower levels of nitrate and selenium, making it better suited for drinking water supplies. Moreover, the water at this depth is "less hard" than water at the intermediate depth, improving quality for municipal uses. Thus, urban water supplies are better derived from the deep aquifer while supplemental supplies are better derived from the intermediate aquifer.

The total capacity of the City wells is 20,241 gallons per minute (gpm).[6] In the majority of situations, the City will use only water derived from its deep wells but will keep the wells in the intermediate levels online for additional uses, as needed.[7] Together, the water supply available through these wells is sufficient to meet the City's needs but are only used to supplement the surface water supplies derived from WDWCA surface water assets.

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6 The total capacity of 20,241 gpm equates to 107.4 AF/day if wells were pumped continuously and at full capacity.

7 Deep well 30 is the first "stand by well" that would be used if surface and groundwater supplies cannot meet demands and wells 23, 24, 26 and 27 are the next stand by wells that would be used. Telephone call with City Staff on July 19, 2017

TABLE 3.15-8: CITY OF DAVIS GROUNDWATER WELLS

WELL NO.	*AQUIFER*	*CAPACITY, GPM*
11	Intermediate	1,360
15	Intermediate	1,178
23	Intermediate	1,700
24	Intermediate	1,855
26	Intermediate	1,591
27	Intermediate	1,058
28	Deep	591
30	Deep	1,712
31	Deep	2,759
32	Deep	2,339
33	Deep	1,750
34	Deep	2,348
	Total Deep Well Capacity	**11,499**
	Total Capacity	**20,241**

NOTE: GPM = GALLONS PER MINUTE.
SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

The Yolo Subbasin is not an adjudicated groundwater basin. The Yolo Subbasin, however, has been declared a "high priority basin" for purposes of the Sustainable Groundwater Management Act (SGMA). The Subbasin is not designated as "critically overdrafted" but it is subject to a rigorous water management program. The water management program is governed by the Water Resources Association of Yolo County (WRA), which is a consortium of local water agencies providing a regional forum to coordinate and facilitate water issues in Yolo County. Moreover, the City of Davis developed a groundwater management plan in 2006 that includes basin management objectives for monitoring and evaluating water levels, water quality, and inelastic ground subsidence. Additional groundwater management actions are anticipated with the development of a Groundwater Sustainability Plan as required by the SGMA. This Plan is in its earliest formative stages.

The City's historical pumping numbers is depicted in Table 3.15-9. As shown in the table, with the development of surface water supplies in 2015, the City has reduced its dependence on groundwater to meet its overall demands. Accordingly, the City will continue to protect and secure its unused groundwater as it implements its conjunctive use projects.

The pumping data noted in Table 3.15-9 shows the significant decrease in groundwater usage within the City that has accompanied the acquisition and use of surface water supplies from WDCWA in 2016. This conjunctive use effort will allow the City to better meet its long-term needs as well as preserve its groundwater assets for additional uses, as needed, in the future. Nevertheless, the utility of wells denoted in Table 3.15-8 as well as the groundwater analysis in the City's 2015 UWMP, demonstrates that there is sufficient groundwater to meet the City's existing needs.

TABLE 3.15-9: CITY OF DAVIS HISTORICAL GROUNDWATER USE

YEAR	GROUNDWATER PRODUCTION(AFY)
2000	14,099
2001	15,112
2002	14,551
2003	14,100
2004	15,100
2005	14,452
2006	14,333
2007	14,762
2008	14,219
2009	12,835
2010	11,957
2011	11,531
2012	12,218
2013	12,338
2014	10,901
2015	9,211
2016	3,704

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

CITY WATER SUPPLY SUMMARY

Tables 3.15-10 and 3.15-11 summarize the City of Davis' reasonably available water supplies in normal- and dry-year conditions.

TABLE 3.15-10: NORMAL YEAR WATER SUPPLY AVAILABILITY

MONTH	CVP SETTLEMENT CONTRACT	PERMIT 20281 (AF)	GROUNDWATER (AF)
January	-	2,200	3,329
February	-	2,200	3,007
March	-	2,200	3,329
April	-	2,200	3,222
May	-	2,200	3,329
June	-	2,200	3,222
July	1,554	-	3,329
August	1,332	-	3,329
September	1,554	-	3,222
October	-	2,200	3,329
November	-	2,200	3,222
December	-	2,200	3,329
Totals	**4,440**	**19,800**	**39,198**

NOTE: CVP SUPPLIES DEPICTED HERE SHOW A SHIFT IN ACQUISITION FROM JUNE TO AUGUST SO AS TO MAXIMIZE THE USE OF ALL AVAILABLE SURFACE WATER SUPPLIES EVEN THOUGH THERE MAY BE ADDITIONAL EXPENSES IN CHANGING THE MONTH OF USE.
SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

TABLE 3.15-11: DRY YEAR WATER SUPPLY AVAILABILITY

MONTH	*CVP SETTLEMENT CONTRACT*	*PERMIT 20281 (AF)*	*GROUNDWATER (AF)*
January	-	2,200	3,329
February	-	2,200	3,007
March	-	2,200	3,329
April	-	2,200	3,222
May	-	-	3,329
June	832.5	-	3,222
July	1,165.5	-	3,329
August	166.5	-	3,329
September	1,165.5	-	3,222
October	-	-	3,329
November	-	2,200	3,222
December	-	2,200	3,329
Totals	**3,330**	**19,800**	**39,198**

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

These supplies may be manipulated as the water assets are needed to meet the City's demands. In other words, the City only utilizes water supplies from its water asset portfolio that it needs to meet its demands. This manipulation may include using more surface water assets under Permit 20281 and the CVP Contract in certain hydrological and regulatory conditions rather than using groundwater. The Permit water supply is equally spread out during available months for use but may be redistributed to other months as needed. The groundwater numbers depicted in the tables below indicate a maximum volume available assuming full utilization of the City's pumping capacity.

City of Davis Water Demand

The projected water demands through 2035 include the buildout demand of the City's existing water system's services area.

HISTORICAL AND EXISTING WATER DEMAND

The City's water demand fluctuated over the past 20 years as population has increased and water conservation practices have been implemented. In 1995, the City's water demand was 12,494 AFY and, in 2010, the City's water demand was 11,955 AFY (City of Davis, 2011). Table 3.15-12 shows the City's water demand (based on water production) for the years 2005 through 2010, and for the single year 2015. It should be noted that the historical water demand numbers shown below for years 2005-2010 were provided from the City of Davis 2010 UWMP, while data for 2015 was provided from the City of Davis Public Draft 2015 UWMP.

TABLE 3.15-12: HISTORICAL POTABLE WATER DEMAND (AFY)

	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2015*
Total Urban Water Management Plan Water Demand	14,452	14,333	14,762	14,219	12,835	11,955	9,212

BASED ON TABLE 3-2- GROUNDWATER- VOLUME PUMPED (DWR TABLE 18), CITY OF DAVIS 2010 URBAN WATER MANAGEMENT PLAN, JULY 2011; AND TABLE 4-1- DEMANDS FOR POTABLE AND RAW WATER – ACTUAL, CITY OF DAVIS 2015 URBAN WATER MANAGEMENT PLAN, MAY 2016.

As shown in Table 3.15-12, the City's 2009 and 2010 potable water demands (based on water production) were about 2,000 to 2,800 AFY lower than 2007 demands (City of Davis, 2011). This reduction in potable water demand is partially due to additional water conservation measures which were implemented during the recent drought, relatively wet conditions in 2010, and a declining economy. This trend has generally been experienced by water utilities throughout California during this period. Additional city-wide conservation efforts undertaken in 2015 reduced water demand even further during that year, to 9,212 AFY (City of Davis, 2015).

FUTURE WATER DEMAND

The City's future water demand is anticipated to increase as approved projects build out and new developments are approved and constructed within the City's water service area. However, the rate of growth within the City service area has slowed as a result of growth management policies and the current economic downturn. Hence, water demands are not anticipated to increase as rapidly as they have in the past.

Water demands through the year 2035 were estimated in the Public Draft 2015 UWMP based on land use projections and unit water demand factors developed in the Water Supply Assessment for the Nishi Gateway Project (Brown and Caldwell, 2015). Unit water demand factors for existing development were developed based on 2013 water demand, estimated acreage, and demographics such as population, employee number, and connection number. These water demands are projected for a normal climate year. Projected future water demand within the City of Davis is shown in Table 3.15-13.

TABLE 3.15-13: PROJECTED FUTURE WATER DEMAND (AF/YR)

	2020	*2025*	*2030*	*2035*
Total Water Demand	13,492	13,971	13,560	13,560

BASED ON TABLE 4-3. TOTAL WATER DEMANDS, AF, CITY OF DAVIS 2015 URBAN WATER MANAGEMENT PLAN, MAY 2016.

It should be noted that 2015 was a dry year that was part of a multi-year drought. This reflects increased water conservation efforts and the Governor's mandated water use reductions. According to the 2015 UWMP, it is anticipated that, in the future, water use may increase but remain lower than the per capita water use demands of those in 2013. Water demand projections from 2020-2035 assume a normal water year type. At buildout of the existing service area in 2023, the overall demand is estimated to be 161 gallons per capita per day (gpcd). With increased water

conservation, overall per capita demand for a normal year type is expected to decrease to 150 gpcd after buildout (City of Davis, 2015).

BUILDOUT DEMAND OF THE EXISTING SERVICE AREA

The buildout population of the City's existing water system service area is estimated to be 73,531. The water demand at buildout of the City's existing water system service area is projected to be 13,258 AFY.[8] The demand is equivalent to an overall demand of 161 gpcd. The projected buildout maximum day demand is 21.3 million gallons per day (mgd). As increased water conservation takes effect and the overall per capita demand is reduced to 150 gpcd, the buildout demand of the existing service area is projected to decline to 12,356 AFY by 2030. The decline in the overall per capita demand after the estimated buildout year of 2023 would result in a similar decline in the connection demand factors. The total demand is reduced after the buildout year in 2023 as the per capita water use within the City's existing service area declines to 150 gpcd by 2030. The total water demand for 2015 and 2020 is determined by assuming the per capita demand is 161 gpcd and 155 gpcd is assumed for 2025.

Demand and Supply Conclusions in the 2015 UWMP

The City of Davis' 2015 UWMP included a number of "Proposed Developments" in the supply reliability analysis for the City. One of the analyzed developments was the "Davis Innovation Center." The Davis Innovation Center was a previous project proposal located on the proposed project site. The UWMP accounted for 619 AF for the entire Innovation Center's 207 acres, which is approximately 2.99 AF per acre. Thus, the proposed project area, which includes 75 acres of the original 207 acres, is budgeted in the UWMP for approximately 221 AF. This total budgeted volume of water is greater than the 211 AF the proposed project is expected to use. Once the proposed raw water supply is accounted for, the City's water system will be using much less than what was budgeted for the project site in the 2015 UWMP.

In addition, the analysis in the City's 2015 UWMP did not account for surface water supplies. Although the development of surface water supplies is mentioned in the UWMP, the UWMP did not account for those supplies in assessing supply availability. The water usage analyzed in the UWMP was derived solely from groundwater supply sources. Thus, the project site's budgeted volume of water, 211 AF, that was contemplated for the Davis Innovation Center in the existing UWMP was also derived solely from groundwater supply sources. Since adoption of the 2015 UWMP, the City has developed surface water sources through the WDCWA.

Water Distribution System

The City's water distribution system operates as one pressure zone with one elevated tank and two ground level storage tanks with booster pump stations. The hydraulic grade in the system is

[8] City of Davis. Draft Environmental Impact Report Mace Ranch Innovation Center Project (SCH# 2014112012) [Table 4.15-9]. August 2013.

based on the level in the elevated tank. The wells are controlled by a Supervisory Control and Data Acquisition (SCADA) system based on the level in the elevated tank.

The City's water system consists of piping ranging from 2 to 14-inches (in). Almost 90 percent of the distribution system consists of 6 to 10-in diameter pipelines. The City's pipeline system was constructed to support localized supply, with wells spread throughout the City. This type of localized supply does not require large diameter transmission mains.

There are three storage tanks in the City's water system, the existing Elevated Tank and West Area Tank (WAT) and the new East Area Tank (EAT). The three tanks have a combined storage of 8.2 million gallons. The WAT has a booster pumping capacity of 4,200 gpm and the EAT will have a total pumping capacity of 6,000 gpm. The WAT and EAT fill during off-peak demand periods and then the booster station pumps stored water back into the system during peak periods based on time and system pressure.

REGULATORY SETTING - WATER SUPPLY

Senate Bill 610

Senate Bill (SB) 610 requires that public agencies in a position of approving certain projects check with the water agency proposed to serve the project to determine if there are sufficient water supplies available to accommodate the project. SB 610 applies to projects that meet the following criteria:

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

SB 610 amended Public Resources Code Section 21151.9 to provide that whenever a city or county decides that a project meets any of the above criteria, it must comply with Section 10910 *et seq.* of the Water Code. Section 10910 *et seq.* of the Water Code was also amended by SB 610 to require a city or county to coordinate the CEQA analysis with the water agency proposed to serve the

project. Section 10910 *et seq*. requires a city or county to identify any public water system that may supply water to a proposed project. The city or county must ask each of these water providers to indicate whether its "total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses." If the city or county cannot receive this information from the water provider, it must provide the water supply assessment itself. It should be noted that the proposed project meets the above listed criteria (i.e. the project has more than 500 dwelling units); therefore, SB 610 is applicable to the proposed project, and a Water Supply Assessment has been prepared.

California Model Water Efficient Landscape Ordinance

The Water Conservation in Landscaping Act was enacted in 2006, requiring the DWR to update the Model Water Efficient Landscape Ordinance (MWELO). In 2009, the Office of Administrative Law (OAL) approved the updated MWELO, which required a retail water supplier or a county to adopt the provisions of the MWELO by January 1, 2010, or enact its own provisions equal to or more restrictive than the MWELO provisions.[9] Because the City of Davis is a "local agency" under the MWELO, it must require "project applicants" to prepare plans consistent with the requirements of MWELO for review and approval by the City of Davis. The City of Davis is in compliance with this state law and uses the MWELO as written for projects within the City Limits. This WSA uses the methods described in the MWELO in setting landscaping irrigation limits. For the purposes of the WSA prepared for this project, the MWELO limit is applied to all aspects of the Proposed Project.

The MWELO applies to new construction with a landscape area greater than 2,500 square feet. The MWELO "highly recommends" use of a dedicated landscape meter on landscape areas smaller than 5,000 square feet, and requires weather-based irrigation controllers or soil-moisture based controllers or other self-adjusting irrigation controllers for irrigation scheduling in all irrigation systems. The MWELO provides a methodology to calculate total water use based upon a given plant factor and irrigation efficiency.[10] Finally, the MWELO requires the landscape design plan to delineate hydrozones (based upon plant factors) and then to assign a unique valve for each hydrozone (low, medium, high water use).

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[9] California Code of Regulations (CCR), Tit. 23, Div. 2, Ch. 27, Sec. 492.4. The MWELO provides the local agency discretion to calculate the landscape water budget assuming a portion of landscape demand is met by precipitation, which would further reduce the outdoor water budget. For purposes of the Water Supply Assessment, precipitation is not assumed to satisfy a portion of the outdoor landscape requirement because the determination of an appropriate effective precipitation factor is highly uncertain given the various landscape slopes, terrain composition, concurrent watering schedules, etc.

[10] In calculating Estimated Total Water Use, the MWELO requires use of at least a 71% irrigation efficiency factor. Assuming 71% irrigation efficiency, the average plant factor must be 0.50. It would be possible to stay within the water budget if the average plant factor were higher than 0.50 by designing a system with an irrigation efficiency higher than 71%. Again, the relationship between a Plant Factor (PF) and Irrigation Efficiency (IE) in the Applied Water formula is: AW=(ETo*PF)/IE.

City of Davis General Plan

The City of Davis General Plan contains the following goals and policies that are relevant to water supply for the proposed project:

Goal WATER 1. Minimize increases in water use. Reduce per capita water consumption by 20 percent as compared to historic use through programs encouraging water conservation.

> **Policy WATER 1.1.** Give priority to demand reduction and conservation over additional water source development.
>
> **Policy WATER 1.2.** Require water conserving landscaping.
>
> **Policy WATER 1.3**. Do not approve future development within the City unless an adequate supply of quality water is available or will be developed prior to occupancy.

Goal WATER 2. Ensure sufficient supply of high quality water for the Davis Planning Area.

> **Policy WATER 2.1**. Provide for the current and long range water needs of the Davis Planning Area, and for protection of the quality and quantity of groundwater sources.
>
> **Policy WATER 2.2**. Manage groundwater resources so as to preserve both quantity and quality of groundwater sources.
>
> **Policy WATER 2.3.** Maintain surface water quality.

City of Davis Urban Water Management Plan

The City of Davis prepared an Urban Water Management Plan (UWMP) in 2015, as required by the Urban Water Management Planning Act of 1983. The focus of the Plan is the conservation and efficient use of water in the Davis service area, and the development and implementation of plans to assure reliable water service in the future. The Plan contains projections for future water use, discusses the reliability of the City's water supply, describes the City's water treatment system, and contains a water shortage contingency plan. In addition, the Plan contains best management practices for efficient water use.

City of Davis Groundwater Management Plan

Under mutual agreement, the City and UC Davis Groundwater Management Plan (GWMP) was developed to address groundwater management needs specific to the City and UC Davis service areas. (These areas are not directly included or managed under the Yolo County Flood Control and Water Conservation District (YCFCWCD) GWMP.) The GWMP documents planned groundwater management activities and describe potential future actions to increase the effectiveness of groundwater management in the Davis area. The GWMP incorporates information from the Phase I and Phase II Deep Aquifer Studies and other regional groundwater investigations into a plan for managing and monitoring the effects of groundwater utilization. The GWMP includes all mandatory and suggested components outlined in CWC §10750 et seq. and §10753.7.

THRESHOLDS OF SIGNIFICANCE - WATER SUPPLY

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment associated with Utilities if it will:

1. Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or

2. Have insufficient water supplies available to serve the project from existing entitlements and resources, or if new or expanded entitlements are needed.

IMPACTS AND MITIGATION MEASURES

Impact 3.15-2: The project may not be adequately served by existing water supply sources under existing and cumulative conditions (Less than Significant)

The proposed project would connect to the City's existing water distribution infrastructure, including the infrastructure located adjacent to the project site, along Risling Court and Covell Boulevard.

The residential and non-residential water use demand resulting from the project is summarized below.

RESIDENTIAL WATER USE

The proposed project anticipates five general lot-size designations with the potential for some residential units within the mixed-use area. The size of the lot has the greatest impact on the annual per-lot demand for water as the irrigation needs for landscaping increase with larger landscaped areas. In contrast, indoor water demands remain relatively consistent regardless of lot size, but do vary slightly based on the number of people per dwelling unit. Distinct demand factors are provided for the following residential uses:

- Indoor Residential Use – this category differentiates the slight variance anticipated to occur between the conventional housing and higher density housing to reflect the difference in people per dwelling unit.
- Outdoor Residential Use – this category addresses the landscape water demands for varying lot sizes and housing types planned within the proposed project.

For purposes of the Water Supply Assessment, residential unit water demand factors are described as "the acre-feet of water use annually per dwelling unit" – or simply put, AF/dwelling unit (AF/du).

Indoor Residential Water Use Factors

The proposed project's residential elements will be built in accordance with all applicable building codes, including the Cal Green Code. Given the longevity of the City of Davis, indoor water use is likely highly variable because homes have been built over a long period of time. Older homes still typically use more water than newer homes, even with the additional requirements such as the Cal Green Code. As homes are remodeled and appliances are replaced, indoor water use falls, but there will always be lingering old appliances and fixtures in older neighborhoods keeping averages higher than new neighborhoods. Because of the age of the City, average indoor use is not accurate for a new development. With this in mind, Tully & Young reviewed a number of meter studies from throughout northern California and has developed an indoor demand estimate that is in line with newer homes and the impacts of the latest Cal Green Code.

Additionally, the size of the house has little impact on indoor water demands. While a bigger house may have more space dedicated to living areas, water use is predicated on bathroom fixtures and appliances, which are limited by the previously mentioned Cal Green Code. For the purposes of the Water Supply Assessment prepared for the proposed project, indoor demands are assumed to vary only slightly based on the number of people per unit. The proposed project's age-restricted units lead to persons per household numbers that differ from previous census records. This difference is due to the fact that age restricted units will almost universally house two people versus the City average of 2.64. For the proposed project, the projected persons per household are 2.64 for non-age restricted and 2.0 for the age-restricted units. To account for the differences in persons per household, the indoor water demand factors differ between housing unit type with age-restricted units having a lower indoor demand.

Outdoor Residential Water Use Factors

The primary factor driving outdoor water use on a per lot basis is the size of the lot and the landscaping square footage. The proposed project includes several residential lot types, each having a unique proposed housing layout and landscaped area. The plantings are intended to consist of low-water, drought-tolerant, and native plants. Landscapes not installed by the developer will be left to the homeowners, where MWELO compliance cannot be guaranteed. However, homeowners will be strongly encouraged to follow the sustainability principles and the City of Davis requires compliance for even small landscape projects.

To provide flexibility for the proposed project to landscape lots as needed and to provide a conservative assumption for this analysis, each lot is assumed to have a landscaped area equal to the lot square footage minus the house footprint and an amount of hardscaping in line with existing similar houses within the City. The remaining area of each lot is conservatively assumed to demand the maximum allowed by the MWELO. However, this characterization provides for a conservative analysis; the landscaping goals set forth by the proposed project will likely result in a lower outdoor residential water demand than is estimated by the Water Supply Assessment because of actions taken by developers and end users to be more water efficient.

A conservative starting point for landscape usage per acre is estimated at 4.01 AF per acre as 85% of the reference evapotranspiration (ETo).[11]

The primary driver that could significantly change both existing residential and non-residential outdoor water demands is the MWELO. In following MWELO methodologies, landscaping demand may be calculated as an estimate of reference ETo. Using demand values estimated for MWELO, a demand per acre or square foot is applied to the average lot size of each category to develop the outdoor demand for each residence type.

Using the outdoor unit demand factor of 4.01 AF/ac/yr and associated landscape area for an average lot in the City, an estimate of current outdoor demands can be derived.[12] Using this same number and the average lot size from the proposed project land use plan, which is a current example of future development in the City, an estimate of future outdoor demands is created. All lot sizes are calculated to use this number. For example, the single family builder lots are expected to share this demand per-acre value but with greater proportions of the lot dedicated to landscape versus areas covered by hardscape and the structure's footprint. The medium density cottage lots are also assumed to have similar per-acre values, but with lesser proportions of the lot dedicated to landscaping. Thus, the larger lots will see per dwelling unit outdoor demand factors that are greater than that of a dwelling unit on a smaller lot, such as a cottage.

The revised MWELO provides for determining the Maximum Applied Water Allowance (MAWA), where the maximum is determined as 55 percent of the ETo for the area for residential projects and 45 percent for non-residential, resulting in the following equation:

MAWA = (ETo) (0.62)(0.55 x LA), where ETo is the reference evapotranspiration in inches per year, LA is the landscape area, and 0.62 is a conversion factor. The resulting value is in "gallons per year"

The ETo value for the City of Davis is 59 inches, as recorded from the California Irrigation Management Information System (CIMIS) Davis Weather Station. The proposed project water demand is based on the following components:

- **Single Family.** The proposed 238 homes, bungalows, and builder lots will include single-family structures with extensive outdoor hardscapes. These proposed designations have lots with an average size of approximately 4,900 square feet. For the purposes of the

[11] ETo is the Evapotranspiration or a standard measurement used to calculate plant water demands. For more information on ETo, refer to MWELO. This value is still accurate for parks under the revised MWELO where special landscaped areas are allowed.

[12] This value is conservative for residential use under the revised MWELO but meter results for newer homes in similar areas support using this conservative value. It is anticipated that a small reduction in this value will be seen in the next meter study performed by the City. This reduction is both due to the conservative nature of the value and to ongoing conservation and improvements in water use efficiencies.

Water Supply Assessment, the proposed project will use the outdoor demand factor, derived in Table 3.15-14, of 0.21 AFY for lots in this category.

- **Cottages.** The proposed 92 cottage lots will include smaller single-family structures with extensive outdoor hardscapes. These designations for the proposed project have lots with an average size of approximately 3,600 square feet. For the purposes of the Water Supply Assessment, the proposed project will use the outdoor demand factor, derived in Table 3.15-14, of 0.13 AFY for lots in this category.
- **High Density Senior Affordable Apartments.** The proposed 150 senior affordable units will include attached multi-family dwellings on a single large lot with an average of about 1,100 square-feet of ground area per unit. This dwelling unit type is typically associated with community controlled outdoor spaces; thus, the average outdoor demands are typically quite low with typically less than a few hundred square feet of landscaping per unit. For the purposes of the Water Supply Assessment, the proposed project will use the outdoor demand factor, derived in Table 3.15-14, of 0.02 AFY for lots in this category.
- **Mixed Use Residential.** The proposed 50 units within the mixed-use area will be an unique dwelling unit type, typically existing above commercial space. Outdoor demands are minimal, if present, but are typically found. For the purposes of this WSA, the proposed project will use the outdoor demand factor, derived in Table 3.15-14, of 0.05 AFY for lots in this category.
- **University Retirement Expansion.** The proposed 30 retirement lots will include smaller single-family structures with extensive outdoor hardscapes. These designations for the proposed project have lots with an average size of approximately 4,350 square feet. For the purposes of the Water Supply Assessment, the proposed project will use the outdoor demand factor, derived in Table 3.15-14, of 0.19 AFY for lots in this category.

The residential water use factors from the Tully & Young Water Supply Assessment prepared for the City of Davis (August 2017), shown in Table 3.15-14, were used to project the potable water demand from the proposed project.

TABLE 3.15-14: CITY OF DAVIS RESIDENTIAL WATER USE FACTORS

WATER DEMAND CATEGORY	*INDOOR FACTOR*	*OUTDOOR FACTOR*	*TOTAL DEMAND FACTOR*
Homes, Bungalows, and Builder Lots	0.19 AF/du	0.21 AF/du	0.40 AF/du
Cottages	0.19 AF/du	0.13 AF/du	0.32 AF/du
Mixed Use	0.19 AF/du	0.05 AF/du	0.24 AF/du
Senior Affordable Apartments	0.15 AF/du	0.02 AF/du	0.17 AF/du
University Retirement Expansion	0.15 AF/du	0.19 AF/du	0.34 AF/du

NOTE: AF/DU = ACRE-FEET PER DWELLING UNIT.

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

NON-RESIDENTIAL WATER USE

The non-residential factors are developed from either details provided in the proposed project land use plan and associated documents, or are based upon recent water use trends for similar types of land classifications found in other supporting materials.

For purposes of the Water Supply Assessment, the per-lot demand for non-residential classifications is described as either "the acre-feet of water use annually per acre of land" (AF/ac), or as a single demand projection for a demand category such as the community center (e.g. which has a unit of "1"), or AF/unit. These values reflect indoor and outdoor water needs expected for typical non-residential use for each of the following classifications:

- Mixed Use – Health Club, Club House, and Restaurant;
- Dog Park;
- Linear Parks;
- Other miscellaneous uses, including common area open space, agricultural setback open space, right-of-way landscaping, and construction water.

The non-residential water use factors from the Tully & Young Water Supply Assessment prepared for the proposed project (August 2017), shown in Table 3.15-15, were used to project the potable water demand from the proposed project.

TABLE 3.15-15: CITY OF DAVIS NON-RESIDENTIAL WATER USE FACTORS

WATER DEMAND CATEGORY	*TOTAL DEMAND FACTOR*
Non-Residential	
Mixed Use	2.80 AF/ac
Public	
Dog Park	4.01 AF/ac
Linear Parks	4.01 AF/ac
Agricultural Transition	2.81 AF/ac
Natural Open Space	0.00 AF/ac
Right of Ways	0.19 AF/ac
Miscellaneous	
Construction Water	1.00 AF/ac

NOTE: AF/AC = ACRE-FEET PER ACRE.
SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

PROPOSED PROJECT WATER DEMAND PROJECTIONS

Combining the proposed project's land use details and phasing with the demand factors presented in Tables 3.15-14 and 3.15-15, the water demands for the proposed project, from ground-breaking to build-out, can be estimated.

Non-Revenue Water Demands

The demand factors represent the demand for water at the residential or non-residential customer meter for each category. To fully represent the demand on water resources, non-revenue water also needs to be included. Non-revenue water represents all of the water necessary to deliver to the customer accounts and reflects distribution system leaks, water demands from potentially un-metered uses (such as fire protection, hydrant flushing, and unauthorized connections), and

inescapable inaccuracies in meter readings.[13] In most instances, the predominant source of non-revenue water is from system leaks – the loss from fittings and connections from water sources through treatment plants, tanks, pumping plants, major delivery system back-bone pipelines, and community distribution systems. Because a significant portion of the delivery system used to bring water to the proposed project will be new, the percentage of non-revenue water is estimated to meet the 10 percent goal set forth by the American Water Works Association. Therefore, the proposed project's water delivery system is expected to require an additional 23 AF at build-out, with 11 AF of that required for outdoor demands that could be mostly met with non-potable water.

Projected Treated Demands Versus Landscape Water Demands

A unique feature of the proposed project is the separation of indoor and outdoor demands. The on-site well, previously used for agricultural purposes, has the capacity to serve more water than is needed on-site. This well would be used to serve the landscaping demands of the project through a separate pipe system. The demand on the City's treatment and distribution system will be limited to the indoor demands. Alternatively, if the agricultural well only services the agricultural buffer, then the outdoor demands on the City's treatment and distribution system would slightly increase. In this case, the demand on the City's treatment and distribution system will be limited to the indoor demands and the non-agricultural buffer, outdoor demands.

Total Demands

The estimated project water demand is shown in Table 3.15-16. At completion, the proposed project is estimated to require approximately 216 AF of water annually (prior to considerations of non-revenue water, described above) and approximately 240 AF when considering non-revenue water.

[13] The American Water Works Association and the California Urban Water Conservation Council recognize the inherent non-revenue water that is either lost or not accounted for in urban treated water distribution systems and suggest purveyors strive for a value of 10% of all delivered water. Obtaining this value is dependent on numerous factors including the age and extent of distribution system infrastructure, meter rehabilitation programs, and how a purveyor accounts for actions such as fire flows and hydrant flushing.

TABLE 3.15-16: ESTIMATED PROPOSED PROJECT WATER DEMANDS

CATEGORY	*DEMAND (AFY)*					
	CURRENT	*2020*	*2025*	*2030*	*2035*	*2040*
Residential						
Homes, Bungalows, and Builder Lots - Indoor	0	0	45	45	45	45
Homes, Bungalows, and Builder Lots - Outdoor	0	0	54	54	54	54
Cottages – Indoor	0	0	6	6	6	6
Cottages – Outdoor	0	0	7	7	7	7
Mixed Use – Indoor	0	0	16	16	16	16
Mixed Use – Outdoor	0	0	1	1	1	1
Senior Affordable Apartments – Indoor	0	0	23	23	23	23
Senior Affordable Apartments – Outdoor	0	0	5	5	5	5
University Retirement Expansion – Indoor	0	0	5	5	5	5
University Retirement Expansion – Outdoor	0	0	6	6	6	6
Indoor Subtotal	*0*	*0*	*95*	*95*	*95*	*95*
Outdoor Subtotal	*0*	*0*	*73*	*73*	*73*	*73*
Non-Residential						
Mixed Use	0	0	7	7	7	7
Indoor Subtotal	*0*	*0*	*7.4*	*7*	*7*	*7*
Public						
Dog Park	0	0	4	4	4	4
Linear Parks	0	0	16	33	33	33
Agricultural Transition	0	0	12	0	0	0
Right of Way Landscaping	0	0	3	3	3	3
Outdoor Subtotal	*0*	*0*	*36.1*	*41*	*41*	*41*
Miscellaneous						
Construction Water	0	0	1	0	0	0
Outdoor Subtotal	*0*	*0*	*1*	*0*	*0*	*0*
Totals						
Indoor Total	0	0	102	102	102	102
Outdoor Total	0	0	110	114	114	114
Total	*0*	*0*	*213*	*216*	*216*	*216*
Outdoor Non-Revenue Water (11%)	0	0	12	13	13	13
Indoor Non-Revenue Water (11%)	0	0	11	11	11	11
Total Indoor	*0*	*0*	*114*	*114*	*114*	*114*
Total Outdoor	*0*	*0*	*123*	*127*	*127*	*127*
Total Proposed Project Demand	***0***	***0***	***236***	***240***	***240***	***240***

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

PROPOSED PROJECT'S WATER SUPPLY SUFFICIENCY ANALYSIS

The sufficiency analysis integrates the proposed project's water demands detailed above with the water supplies characterized in the Existing Setting. The assessment incorporates the City's existing and planned future uses as discussed in the 2015 UWMP. The maximum annual water supply results are presented in Table 3.15-17 beginning with "current" conditions (recognized as 2016, the first year with surface water contract use)[14] and continuing with 5-year increments from

[14] This period was chosen to represent the "current" condition because of the surface supply addition. It is recognized that the drought impacts reduced water use over the current normal use; thus, the current groundwater portion of supplies was conservatively approximated at 4,000 AF, slightly higher than projected.

2015 through 2040. While the analysis at various intervals before build-out is important, the most critical projection for the sufficiency analysis occurs beyond 2030 when build-out is projected in the 2015 UWMP. This analysis assumes that the proposed project is fully constructed, well before the City's build-out.

TABLE 3.15-17: MAXIMUM ANNUAL WATER SUPPLY AVAILABILITY

SURFACE WATER AND GROUNDWATER	*ESTIMATED SUPPLY (AFY)*					
	CURRENT	*2020*	*2025*	*2030*	*2035*	*2040*
Normal Year						
Surface Water	24,420	24,420	24,420	24,420	24,420	24,420
Groundwater	39,198	39,198	39,198	39,198	39,198	39,198
Normal Year Total	**63,618**	**63,618**	**63,618**	**63,618**	**63,618**	**63,618**
Dry Year						
Surface Water	16,530	16,530	16,530	16,530	16,530	16,530
Groundwater	39,198	39,198	39,198	39,198	39,198	39,198
Dry Year Total	**55,728**	**55,728**	**55,728**	**55,728**	**55,728**	**55,728**

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

As noted in the Existing Setting, the City will only utilize the water supplies that are needed to meet its annual demands. Thus, a depiction of the total available supplies in Table 3.15-17 is misleading in terms of how water will be used. First, as noted in previously, although the City has the physical capacity to pump significant volumes of groundwater, this amount of groundwater will likely never be used – even if the City were to utilize groundwater to meet its entire build-out demands. Thus, characterizing the pumping capacity as the groundwater supply overestimates actual groundwater utility, even though it is technically possible to produce significant volumes of groundwater.

Second, with the development of the WDCWA's surface water supplies, the City anticipates using as much surface water during a water year as can be made available through the new project. Importantly, the City anticipates developing active conjunctive use projects with its surface water supplies so that more surface water can be stored and less naturally-occurring groundwater will be used. All of these efforts to develop additional water supplies are in the planning stages with the WDCWA. For purposes of the Water Supply Assessment sufficiency analysis, however, the proposed project and future planned projects were assumed to only utilize the water assets that are currently available to the City.

The normal year and dry year sufficiency analyses are derived from the water rights and contractual limitations that the WDCWA has established. The key provisions of these water assets, as described previously, are as follows:

- Permit 20281: In normal years, as much as 19,800 AF could be available depending on whether Term 20 is instituted and in what months the water supply is curtailed. In dry years, the direct diversion water supplies under this Permit are assumed to be unavailable from May through October. This reduction in diversion months likely necessitates that the City reduce its overall dependence on the Permit supply to 13,200 AF.

- CVP Settlement Contract: In normal years, 10,000 AF is available to the WDCWA, of which 4,400 AF is available to the City of Davis. In dry years, the total available to WDCWA is reduced to 7,500 AF, of which 3,330 AF is available to the City of Davis.

Table 3.15-18 shows the anticipated water demands for the City as it approaches buildout. These water demands are derived from the City's 2015 UWMP, as well as the anticipated proposed project demands depicted above.

TABLE 3.15-18: CURRENT NORMAL YEAR ANNUAL AND PLANNED FUTURE ANNUAL DEMANDS

SURFACE WATER AND GROUNDWATER	*ESTIMATED DEMAND (AFY)*				
	2020	*2025*	*2030*	*2035*	*2040*
City of Davis Demand	14,227	14,416	13,992	13,992	13,992
Proposed Project Demand	0	236	240	240	240
Total Demand	**14,227**	**240**	**14,232**	**14,232**	**14,232**

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

Conservative modifications to the estimated demands of the proposed project are made to reflect conditions expected during single-dry and multiple dry year events as follows:

- *Single dry year*: Landscape irrigation demands will increase to reflect the generalized earlier start of the landscape irrigation season due to limited rainfall in the single driest year. Since this increase only applies to the outdoor portion of a customer's demand, an adjustment factor of five percent is applied to the total normal-year water demand values to conservatively reflect the expected increase in demand for water.
- *Multiple dry years*: During multiple dry years, demands are also expected to increase during the first in a series of dry years – as discussed above for the single dry year condition. However, during the second and third consecutive dry years, demands also are expected to reflect water shortage contingency plans implemented by the municipal water purveyor.[15] During the second year, the water purveyor is assumed to request a reduction target of 10 percent. The resulting demand, however, only reflects a five percent reduction to accommodate conservatively low participation by customers. During the third year, the purveyor is expected to set a conservation target of 20 percent. For this analysis, the demands in the third year are only reduced by 10 percent to, again, reflect a conservatively low participation rate by the customers. Thus, during multiple dry conditions, demands both increase due to reduced effective precipitation, but also decrease (from the increased demand) to reflect implementation of short-term conservation measures.

[15] Though the municipal water purveyor does not exist yet for the Proposed Project, this WSA assumes that whatever purveyor is established will develop a water shortage contingency plan to address drought conditions.

Table 3.15-19 shows the anticipated dry year water demands for the City as it approaches buildout. These water demands are derived from the City's 2015 UWMP as well as the anticipated proposed project demands with the dry year impacts, as described above.

TABLE 3.15-19: CURRENT ANNUAL DEMANDS AND PLANNED FUTURE ANNUAL DEMANDS FOR SINGLE-DRY AND MULTIPLE-DRY YEARS

CITY OF DAVIS		ESTIMATED WATER DEMAND (AFY)				
		2020	2025	2030	2035	2040
Single-Dry / Multi-Dry Year 1	City of Davis Demand	14,938	15,137	14,692	14,692	14,692
	Proposed Project	0	224	228	228	228
	Total Demand	**14,938**	**15,361**	**14,920**	**14,920**	**14,920**
Multi-Dry Year 2	City of Davis Demand	12,804	12,974	12,593	12,593	12,593
	Proposed Project	0	212	216	216	216
	Total Demand	**12,804**	**13,186**	**12,809**	**12,809**	**12,809**
Multi-Dry Year 3	City of Davis Demand	11,382	11,533	11,194	11,194	11,194
	Proposed Project	0	212	216	216	216
	Total Demand	**11,382**	**11,745**	**11,410**	**11,410**	**11,410**

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

CITY OF DAVIS WATER SUPPLY SUFFICIENCY ANALYSIS

The following section details the sufficiency of the City of Davis' water supplies as compared with total demands for normal, single-dry, and multi-dry year periods. Tables 3.15-2 and 3.15-21 provide the sufficiency analysis conclusions.

TABLE 3.15-20: WATER DEMAND AND SUPPLY COMPARISONS DURING NORMAL, SINGLE-DRY, AND MULTIPLE-DRY YEARS

YEAR	PROJECTED BASELINE DEMAND (AF)			HYDROLOGIC YEAR TYPE	WATER SUPPLIES (AF)				
	CITY OF DAVIS	WDAAC	TOTAL		PERMIT	CVP	SURFACE WATER USED	GROUND-WATER SUPPLY	GROUND-WATER USED
2020	14,227	0	14,227	Normal	19,980	4,440	9,763	39,918	4,464
				Single Dry	13,200	3,330	8,761	39,918	6,177
				Multiple Dry Yr. 3	13,200	3,330	7,788	39,918	3,594
2025	14,416	236	14,663	Normal	19,980	4,440	9,851	39,918	4,812
				Single Dry	13,200	3,330	8,824	39,918	6,572
				Multiple Dry Yr. 3	13,200	3,330	7,908	39,918	3,823
2030	13,992	240	14,226	Normal	19,980	4,440	9,794	39,918	4,432
				Single Dry	13,200	3,330	8,761	39,918	6,177
				Multiple Dry Yr. 3	13,200	3,330	7,788	39,918	3,593
2035	13,992	240	14,226	Normal	19,980	4,440	9,794	39,918	4,432
				Single Dry	13,200	3,330	8,761	39,918	6,177
				Multiple Dry Yr. 3	13,200	3,330	7,788	39,918	3,593
2040	13,992	240	14,226	Normal	19,980	4,440	9,794	39,918	4,432
				Single Dry	13,200	3,330	8,761	39,918	6,177
				Multiple Dry Yr. 3	13,200	3,330	7,788	39,918	3,593

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

TABLE 3.15-21: WATER SUPPLY SUFFICIENCY AT BUILD-OUT

MONTH	DEMAND			SUPPLY			SURPLUS		
	NORMAL	SINGLE-DRY	MULTI-DRY	NORMAL	SINGLE-DRY	MULTI-DRY	NORMAL	SINGLE-DRY	MULTI-DRY
Jan	619	650	620	5,529	5,529	5,529	4,910	4,879	4,909
Feb	654	687	582	5,207	5,207	5,207	4,553	4,520	4,625
Mar	970	1,018	834	5,529	5,529	5,529	4,559	4,511	4,695
Apr	1,073	1,127	908	5,422	5,422	5,422	4,349	4,295	4,514
May	1,485	1,559	1,091	5,529	3,329	3,329	4,044	1,770	2,238
Jun	1,649	1,731	1,195	5,422	4,055	4,055	3,773	2,324	2,859
Jul	1,777	1,865	1,298	4,883	4,495	4,495	3,106	2,629	3,197
Aug	1,693	1,777	1,304	4,659	3,496	3,496	2,966	1,718	2,192
Sept	1,420	1,491	1,245	4,776	4,388	4,388	3,356	2,897	3,143
Oct	1,317	1,383	1,093	5,529	3,329	3,329	4,212	1,946	2,236
Nov	906	951	659	5,422	5,422	5,422	4,516	4,471	4,763
Dec	665	698	551	5,529	5,529	5,529	4,864	4,831	4,978
Total	**14,226**	**14,937**	**11,381**	**63,436**	**55,728**	**55,728**	**49,210**	**40,791**	**44,347**

SOURCE: SB 610 WATER SUPPLY ASSESSMENT, TULLY & YOUNG, AUGUST 2017.

In short, the City has both surplus surface water and groundwater during all months of usage during normal, single dry, and multiple-dry years. As noted previously, the anticipated source used to meet monthly demands may vary based upon the City's desire to conjunctively manage its water assets to maximize their utility.

WATER SYSTEM CAPACITY

Based on the comparison of contracted rights and projected citywide demands, there is ample water supply for the City to reach its projected build-out. Rights only entitle the City to the water, and infrastructure is needed to actually deliver supplies to the proposed project. Primary infrastructure includes treatment, pumping, and piping.

Existing Treatment Plant Capacity

The new WDCWA Treatment Plant was built to supply water to Woodland, Davis, and UC Davis. All designs are recent and capacities were designed to serve the cities and UC Davis as they currently exist. As the proposed project site is located on land that was accounted for in the 2015 UWMP, it is safe to assume that adequate surface water capacity exists to serve the proposed project.

Groundwater System Capacity

As discussed previously, the City has an ample supply of water to accommodate future development. With the transition to surface water, there is an abundance of groundwater well capacity. This system can provide more water for use in curtailment periods as well as peak demands that will likely ever be needed. The City will be optimizing the groundwater system to minimize maintenance costs, maintain appropriate backup supplies, and maintaining water quality in the system.

System Infrastructure Capacity

The proposed project will finance all needed infrastructure upgrades necessary to serve on-site metered demands and meet fire-flow requirements. The City of Davis operates an extensive Innovyze-based water model. Further, the City is currently installing advanced metering infrastructure which will allow for improved system analysis. The proposed project will rely on information from the City's system model to ensure sufficient capacity.

NON-POTABLE SOURCE SCENARIO

An existing agricultural supply well that was previously used for irrigation on the property is located on the southwest portion of the project site. The project proposes to convert this agricultural supply well to an irrigation well to supply non-potable supplies for landscape irrigation needs on-site. This is proposed to offset the high costs of treated water with the lower cost of simply pumping underlying groundwater.

The well and landscape water system would be owned and operated by a homeowners association or other type of community governance. Purple pipe would be used to ensure no accidental cross connections are made. Well water in the area is generally of potable quality, so body contact does not carry the same risk as recycled water; however, no drinking level monitoring will be conducted. The total impact to the supply availability may not differ even if this groundwater well is used because the City already accounts for the groundwater usage in its estimation of available supply. Development of a new well does not necessarily equate to an additional supply but simply may offset one source of supply for another source of supply from the same groundwater source.

Potential Impacts to Other Neighboring Groundwater Users

An existing neighborhood is located north of the project site which is served by groundwater; these residents have expressed concern over impacts to their water rights by use of well water to serve the proposed project. There are no likely risks or impacts to the existing users based on a number of factors, primarily being the City's shift to surface water supplies. Additionally, the rights of these water users are juxtaposed against the appropriation of the proposed project so effort and money would not be spent on the non-potable system without secure knowledge that water would be available.

As a reference point, if the parcel had historically been irrigated as part of an agricultural production operation, groundwater use per acre would have been much higher than the proposed use. As defined in Table 3.15-16, the proposed maximum outdoor demands are approximately 110 AFY. Typical agricultural demands are between 3 and 5 AFY per acre; thus, the proposed 75-acre site would have been using at least double what the proposed project is expected to require.

In 2016, the WDCWA Treatment Plant came online and began to serve surface water to the City. With the treatment plant in operation, well pumping has declined by over 10 MGD. While most of the large City production wells are deeper, some are in the same zone as residential wells in the area north of the City. With the City pumping seriously curtailed, it is anticipated that groundwater levels will rebound in and around the City. This reduction in pumping by thousands of AF is much

more likely to benefit the groundwater users to the north than the proposed pumping of just over 100 AF.

CONCLUSION

Based on the analysis described above, the City's existing water supplies are sufficient to meet the City's existing and projected future potable water demands, including those future potable water demands associated with the proposed project, to the year 2040 under all hydrologic conditions (normal years and dry years). The expected water demand of approximately 216 AFY is small in comparison to the existing and projected year 2040 potable water supply surpluses. Additionally, the water demand resulting from development and operation of the project would be significantly lower than what was assumed for the project site in the City's 2015 UWMP. Therefore, the proposed project would result in a ***less than significant*** impact to water supplies, and no new water production, treatment or extraction facilities would be required to serve the proposed project. No mitigation is required.

3.15.3 SOLID WASTE

EXISTING SETTING

Solid waste collection and disposal in the City of Davis (including the project site) is provided by Davis Waste Removal, Inc. (DWR). DWR has a drop-off and buy-back center and provides residential curbside, apartment, and business collection services. In addition to the weekly garbage service, DWR provides green waste and recycling pickup and street sweeping service. Recoverable items include: mixed paper, glass, aluminum cans, steel and tin cans, some plastics, corrugated cardboard, yard waste, and used motor oil.

Local solid waste management planning is governed by the Integrated Waste Management Act of 1989. The Act established strict mandates for local agencies to achieve a 25 percent reduction in solid waste disposed of by 1995 and a 50 percent reduction by the year 2000. Each city is required to prepare, adopt, and submit to the County a Source Reduction and Recycling Element (SRRE). Counties must also prepare a SRRE for unincorporated areas.

Non-recyclable waste generated by the City of Davis is disposed of at the 722-acre Yolo County Central Landfill, which is located off County Road 28H near its intersection with County Road 104. The landfill is owned and operated by the Yolo County Department of Planning and Public Works. As described in the Yolo County General Plan Draft EIR (Yolo County, April 2009), the Central Landfill is a Class III solid waste landfill which provides comprehensive solid waste and recycling services, including municipal solid waste, recycling, salvaging, household hazardous waste, and business hazardous waste. Permitted maximum disposal ("throughput") at the Central Landfill is 1,800 tons per day. At the current waste disposal rate (also assuming a diversion rate of 70 percent, no large increase of waste from outside the County, and future waste cells operated as bioreactors described below) the landfill's closure date is estimated to be January 1, 2081. The Central Landfill has several unique features and operations that distinguish it from typical waste management facilities and has been recognized by the U.S. Environmental Protection Agency for its innovative approach to reducing its impact on the environment, as follows:

- Bioreactor. A portion of the landfill is operated as a bioreactor, where the decomposition of waste is accelerated by adding liquid and recirculating the leachate. This process enhances the growth of microbes that promote solid waste decomposition, and as a result, landfill waste can be decomposed and stabilized within 10 to 15 years rather than decades. Benefits of bioreactor operations include: an increased rate of gas generation and energy production which allows increased gas collection efficiency and a reduction in greenhouse gas emissions; reduced pollution; extended use of the landfill facility by refilling stabilized areas; and reduced closure maintenance costs.

- Phytoremediation. The area surrounding the landfill has a high groundwater table. In order to keep the groundwater table low, groundwater is pumped from 16 wells along the northern landfill boundary. Shallow groundwater in this area of the valley contains boron and selenium. These minerals are naturally-occurring but the amount in the water is too high for the water to be released into the adjacent Willow Slough bypass. As a result, the landfill uses phytoremediation (treating water with plant growth) to reduce the boron and selenium concentrations present in the groundwater. The water is stored and used to grow 45-acre parcels of kenaf, a hibiscus relative, which is known to accumulate boron and selenium. The kenaf is harvested and used as alternative daily cover at the landfill in place of soil.

- Energy Production. A landfill gas-to-energy plant is located in the southwest portion of the landfill. The plant owner leases rights to the landfill gas and the energy production rights from the County under an agreement, and subcontracts with Minnesota Methane to operate the energy plant. The plant produces a maximum of 3,860 kilowatts per hour.

REGULATORY SETTING - SOLID WASTE

California's Integrated Waste Management Act of 1989 (AB 939)

California's Integrated Waste Management Act of 1989 (AB 939) set a requirement for cities and counties to divert 50 percent of all solid waste from landfills by January 1, 2000, through source reduction, recycling and composting. In order to achieve this goal, AB 939 requires that each City and County prepare and submit a Source Reduction and Recycling Element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity.

AB 939 also established requirements for cities and counties to develop and implement plans for the safe management of household hazardous wastes. In order to achieve this goal, AB 939 requires that each city and county prepare and submit a Household Hazardous Waste Element.

75 Percent Solid Waste Diversion

AB 341 requires CalRecycle to issue a report to the Legislature that includes strategies and recommendations that would enable the state to recycle 75 percent of the solid waste generated in the state by January 1, 2020, requires businesses that meet specified thresholds in the bill to arrange for recycling services by July 1, 2012, and also streamlines various regulatory processes.

Construction and Demolition Waste Materials Diversion

Senate Bill 1374 (SB 1374), Construction and Demolition Waste Materials Diversion Requirements, requires that jurisdictions summarize their progress realized in diverting construction and demolition waste from the waste stream in their annual AB 939 reports. SB 1374 required the California Integrated Waste Management Board (CIWMB, which is now CalRecycle) to adopt a model construction and demolition ordinance for voluntary implementation by local jurisdictions.

California Green Building Standards Code (CALGreen)

CALGreen requires the diversion of at least 50 percent of the construction waste generated during most new construction projects (CALGreen Sections 4.408 and 5.408) and some additions and alterations to nonresidential building projects (CALGreen Section 5.713).

City of Davis Municipal Code, Chapter 32

Chapter 32 of the City's Municipal Code regulates the management of garbage, recyclables, and other wastes. Chapter 32 sets forth solid waste collection and disposal requirements for residential and commercial customers, and addresses yard waste, hazardous materials, recyclables, and other forms of solid waste. Article 32.04 establishes the Diversion of Construction and Demolition Debris Ordinance, which requires projects necessitating a building permit, with exceptions as set forth in the ordinance, to divert fifty percent of construction and demolition debris generated from applicable construction, remodeling, or demolition projects from disposal to landfills through recycling, reuse and diversion programs.

City of Davis General Plan

The City of Davis General Plan contains the following goals and policies that are relevant to solid waste disposal and recycling:

Goal MAT 1. Enhance the quality of the environment by conserving resources and minimizing waste by reducing, reusing, recycling, and re-buying.

Policy MAT 1.1. Promote reduced consumption of non-renewable resources.

Goal MAT 2. Provide adequate waste disposal capacity for Davis.

Policy MAT 2.1. Plan for the long-term waste disposal needs of Davis.

THRESHOLDS OF SIGNIFICANCE - SOLID WASTE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a less than significant impact on the environment associated with Utilities if it will:

1. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.
2. Comply with federal, State, and local statutes and regulations related to solid waste.

IMPACTS AND MITIGATION MEASURES

Impact 3.15-3: The project may not be served by a permitted landfill with sufficient capacity to meet the solid waste disposal needs of the project (Less than Significant)

Average solid waste generation rates are calculated using a per capita factor derived by dividing total solid waste by the current population. Although done on a per capita basis, this rate reflects all land uses within the City. The "per person generation rate" in the City was estimated at 3.12 pounds per day in the 2000 General Plan Update EIR (p. 5C-9).

The proposed project would be a residential development, resulting in the addition of up to 560 residential units (up to 483 age-restricted units and up to 77 non-age restricted units) in total. This would allow for a maximum population of approximately 1,467 residents, based on the number of units planned for development.[16] It is noted that, because 86% of the proposed units would be age-restricted, the actual population growth resulting from the project would likely be significantly lower. For example, the average persons per household in California for homes with a household head that is 55 years or older is 1.87. The maximum population associated with the project, 1,467 persons, utilizes the persons per household rate for the City of Davis of 2.62 persons.

Using the General Plan Update EIR's generation rate of 3.12 pounds per person per day, the proposed project would generate approximately 4,577 lbs/day of solid waste from the proposed residential uses. This is equivalent to a total of approximately 2.29 tons/day of solid waste. Additionally, as described in Section 2.0, current plans for the proposed mixed use area include an 8,000 square foot (sf) health club and a 5,000 sf "fast casual" restaurant. In order to determine solid waste generation from the proposed health club, a rate of 5.0 lbs/day, per 1,000 sf was used. In order to determine solid waste generation from the proposed restaurant, a rate of 0.005 lbs/day, per sf was used. These waste generation rates are consistent with the guidance provided by the California Department of Recycling and Resources Recovery for commercial uses. Therefore, the non-residential components of the project would generate up to 65 lbs/day (40 lbs/day from the health club and 25 lbs per day from the restaurant) of solid waste. Total solid waste generated by all aspects of the project would be 4,642 lbs/day, or approximately 2.32 tons/day.

The proposed project would be required to comply with applicable state and local requirements including those pertaining to solid waste, construction waste diversion, and recycling. Specifically, Chapter 32 of the City's Municipal Code regulates the management of garbage, recyclables, and other wastes. Chapter 32 sets forth solid waste collection and disposal requirements for residential and commercial customers, and addresses yard waste, hazardous materials, recyclables, and other forms of solid waste.

[16] Calculated using 2.62 persons per household for the City of Davis, California (Department of Finance, 2016).

As previously described, permitted maximum disposal at the Central Landfill is 1,800 tons per day. The total permitted capacity of the landfill is 49,035,200 cubic yards, which is expected to accommodate an operational life of about 68 years (January 1, 2081). The addition of the volume of 2.32 tons/day of solid waste generated by the proposed project to the Yolo County Central Landfill would not exceed the landfill's remaining capacity. This is a ***less than significant*** impact.