4.15 UTILITIES

4.15.1 INTRODUCTION

The Utilities section of the EIR describes the utilities provided in the City of Davis, including domestic water supply and delivery, wastewater collection and treatment, solid waste disposal, electricity and natural gas, and telecommunications. Utility demands resulting from proposed project implementation are assessed, and for those utilities where demand would exceed supply, impacts and mitigation are identified. Information for this section was drawn from project information provided by the *Water Supply Assessment* (see Appendix K),[1] the *Hydraulic Model Analysis of Existing System Impacts from Davis Innovation Center, Mace Innovation Center, and Nishi Property Water Demands letter* (see Appendix L),[2] the *Impacts of Innovation Center/Nishi Property Development on Wastewater Treatment Plant Capacity* Technical Memorandum (see Appendix M),[3] the *Impacts of Innovation Center/Nishi Property Development on Wastewater Collection System Capacity* Technical Memorandum (see Appendix M),[4] the *City of Davis General Plan*[5] and associated EIR,[6] *City of Davis 2010 Urban Water Management Plan*,[7] the *Davis Integrated Waste Management Plan*, [8] as well as other sources noted within the section.

4.15.2 EXISTING ENVIRONMENTAL SETTING

The following section describes the existing utilities, including water supply and delivery, wastewater collection and treatment, solid waste disposal, electricity and natural gas, and telecommunications in the City of Davis.

As discussed in other chapters, the proposed project includes a request for annexation of 228.58 acres from Yolo County to the City of Davis. The 212-acre portion of the project site, known as the MRIC, is the subject location of the private innovation center development application. The remaining 16.58-acre portion of the project site is known as the Mace Triangle, which has been included within the overall limits of the project site for annexation purposes only, to avoid the

1 Brown and Caldwell. *Water Supply Assessment.* June 2015.
2 Brown and Caldwell. *Letter: "Hydraulic Model Analysis of Existing System Impacts from Davis Innovation Center, Mace Innovation Center, and Nishi Property Water Demands"*. March 17, 2015.
3 West Yost Associates. *Impacts of Innovation Center/Nishi Property Development on Wastewater Treatment Plant Capacity*. Technical Memorandum (Final). April 2, 2015.
4 West Yost Associates. *Impacts of Innovation Center/Nishi Property Development on Wastewater Collection System Capacity*. Technical Memorandum. March 25, 2015.
5 City of Davis. *Davis General Plan.* Adopted May 2001. Amended through January 2007.
6 City of Davis. *Program EIR for the City of Davis General Plan Update and Project EIR for Establishment of a New Junior High School*. January 2000.
7 City of Davis. *City of Davis 2010 Urban Water Management Plan.* Updated November 2014.
8 City of Davis. *Davis Integrated Waste Management Plan*. July 2013.

creation of an unincorporated County "island" property upon annexation of the 212-acre MRIC site.

Water Supply

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 UC Davis campus to the south, and additionally includes the El Macero (located south of Interstate 80 [I-80]), Willowbank, and the Royal Oak Manufactured Home Community areas that are located outside of the City's boundary (see Figure 4.15-1). 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.

Water Supplies

The City's current water supplies are primarily groundwater, and wholesale water supply.

Groundwater

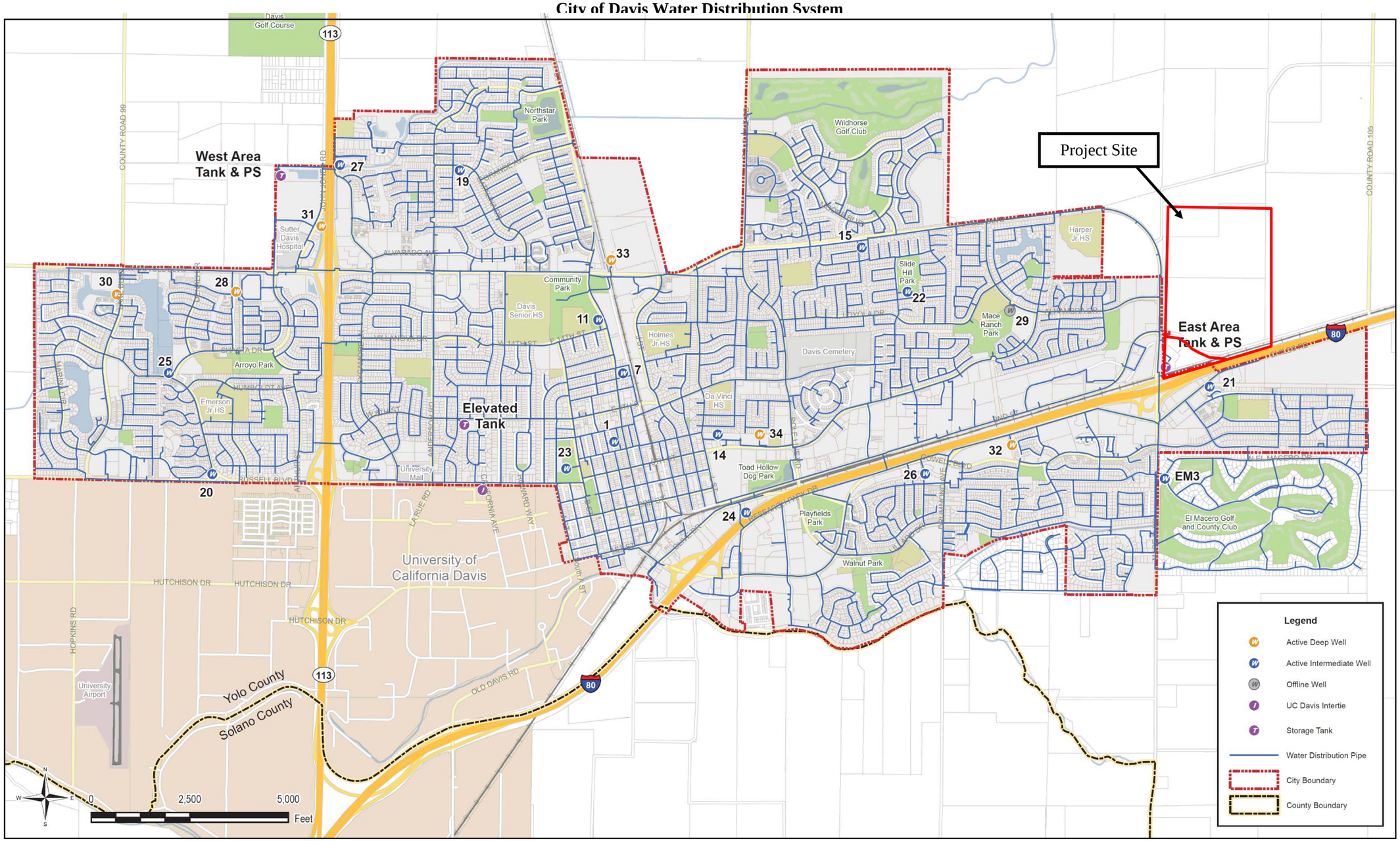
The following section provides the legislative background on groundwater within the State of California and City of Davis, as well as a description of the characteristics of the groundwater aquifers in Davis.

Background on Legislation

The City currently uses groundwater as the sole potable water supply source. The City pumps groundwater from the Yolo Basin, which is a portion of the larger Sacramento Valley groundwater basin. The Yolo Basin is subject to the 2014 Sustainable Groundwater Management Act (SGMA), which became effective January 31, 2015. The SGMA applies to the 127 High and Medium Priority groundwater basins, which account for approximately 96 percent of groundwater use in California. The Yolo subbasin is designated as High Priority under the Sustainable Groundwater Management Act. The SGMA requires High and Medium Priority basins under the California Statewide Groundwater Elevation Monitoring (CASGEM) program subject to critical conditions of overdraft to be managed under a groundwater sustainability plan by January 31, 2020 (Water Code § 10720.7(a) (1)), and requires all other groundwater basins designated as High or Medium Priority basins to be managed under a groundwater sustainability plan by January 31, 2022 (Water Code § 10720.7 (a) (2)). According to Bulleting 118, the Yolo subbasin is not subject to Critical conditions of overdraft.[9]

[9] Department of Water Resources. *Bulletin 118 [pg. 98]*. Update 2003,

Figure 4.15-1
City of Davis Water Distribution System



Source: City of Davis. City of Davis 2010 Urban Water Management Plan. Updated November 2014.

The SGMA requires the formation of local groundwater sustainability agencies (GSAs) that must assess conditions in their local water basins and adopt locally-based management plans. The SGMA provides substantial time (20 years) for GSAs to implement plans and achieve long-term groundwater sustainability. It protects existing surface water and groundwater rights and does not impact current drought response measures. The City is in the planning stages to partner with other local agencies to comply with the SGMA.

On April 1, 2015, the Governor proclaimed a continued state of emergency directing the SWRCB to enhance emergency regulations adopted in 2014 and reaffirmed on March 17, 2015. The Governor's Executive Order B-29-15 sets 2013 as a base year and directed the SWRCB to impose restrictions to achieve a statewide 25 percent water reduction through February 28, 2016.

On May 5, 2015 the State Water Resources Control Board adopted emergency regulations, which included a number of new prohibitions for end users of water and also required the City to reduce its' water production by 28% between June 2015 and February 2016 as compared to the same calendar months in 2013 (June 2013 through December 2013, January 2013, and February 2013). The regulations were approved by the California Office of Administrative Law on May 18, 2015. The regulations are effective as of May 18, 2015. Therefore, the City has an obligation to implement the new regulations immediately. On June 2, 2015, the City of Davis adopted an Urgency Ordinance designed to move this forward by adopting City regulations to implement the State mandates and to provide for penalties and enforcement of the regulations.

The regulations correspond to Davis' 2010 Urban Water Management Plan's Stage 2/Stage 3 Water Shortage Contingency Plan and is consistent with the SWRCB's regulations previously adopted on July 15, 2014 and reaffirmed March 17, 2015. The requirements include:

- Prohibiting using water for street and sidewalk cleaning and gutter flooding
- All plumbing leaks must be corrected
- Car wash facilities must use recycled water
- No watering outdoors between 9 a.m. and 6 p.m., except with a hand-held container or hose with a shut-off nozzle, or for very short periods when adjusting a sprinkler system;
- Outdoor watering is restricted to three days a week: Tuesday, Thursday and Saturday for premises with odd numbered addresses and Wednesday, Friday and Sunday for premises with even numbered addresses. No outdoor watering on Monday;
- No watering during periods of rain.
- Unlawful for any person to apply potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private walkways, roadways, parking lots, or structures.
- Unlawful for any person to use a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shot-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

- Unlawful for any person to apply potable water to driveways and sidewalks.
- Unlawful for any person to use potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.
- Unlawful for any restaurant to serve drinking water unless a patron requests drinking water.
- Unlawful for any restaurant to wash dishes unless the dish washing system is fitted with a water saving dish wash spray valve.
- Unlawful to install non-recirculating water systems at new commercial car washes and laundry systems.
- Unlawful for hotels and motels to fail to provide guests with notice and the option to decline daily bed linen and towel changes.

Local Groundwater Aquifer Characteristics

The City obtains groundwater from both the deep and intermediate depth aquifers. The City's deep aquifer zone exists throughout the service area, and is more predominant to the north and west. The deep aquifer zone slopes downward from the west of the service area, with gradual flattening towards the east. Both the City and UC Davis primarily rely on the deep aquifer due to its generally better quality in terms of hardness and total dissolved solids compared to water produced from the intermediate depth aquifer.

The productive aquifers in the Davis area of Yolo County occur in the Tehama and younger formations. In most areas of Yolo County, the sands and gravel of the Tehama Formation are thin, discontinuous layers between silt and clay deposits. In much of the eastern portion of Yolo County, productive aquifers are found up to 700 feet below ground surface with few productive aquifers in the 700-foot to 1,000-foot depth range. In the area (especially to the west), good quality water is also found in the Tehama Formation at depths of approximately 1,200 feet to 1,500 feet.

Aquifers in the Davis area are recharged by percolation of rainfall and to a lesser extent irrigation water. Other significant sources include infiltration in streambeds, channels, and the Yolo Bypass. Relatively course-grained deposits line both Putah and Cache Creeks, allowing substantial infiltration. The deep aquifer has a much longer recharge period as compared to the intermediate depth aquifer, on the order of thousands of years versus hundreds of years, respectively.

Bulletin 118 states that the Yolo Basin does not exhibit any significant declines in groundwater levels, with the exception of localized pumping depressions in several areas, including in the vicinity of Davis. Historical groundwater elevation measurements show that groundwater elevations declined through the 1950s and 1960s and then increased as a result of the implementation of the Lake Berryessa and Indian Valley Reservoir regional surface water supply projects. In addition to the groundwater elevation changes resulting from variation in land and water use practices over time, groundwater elevations have fluctuated in response to changes in precipitation. Groundwater elevations in the falls of 1977 and 1992 were near the historical lows recorded in the mid-1960s. The

maximum groundwater elevation measurements were recorded in spring 1983, the same year that the maximum annual precipitation was recorded.

In the vicinity of Davis and UC Davis, the base of fresh groundwater occurs at a depth of approximately 2,800 feet below mean sea level, implying that the fresh water aquifer is about 2,800 feet thick. The total amount of water contained to a depth of 2,000 feet in the 11,600-acre groundwater management plan area is estimated to be over 2 million ac-ft. The amount of water in storage is estimated to be approximately 120,000 ac-ft, assuming a specific yield of 10 percent.

The City's groundwater supply is provided by 20 active wells that are located within the City's water system service area. The City's historical annual water production for the potable water system, which is totally made up of groundwater, is depicted in Figure 4.15-2.

The City of Davis plans to reduce the amount of groundwater use and only use the deep aquifer wells once surface water becomes available. The intermediate aquifer wells would be retired, placed on standby, and/or converted to non-potable service. Wells 31, 32, 33, and 34 would be the priority operating wells, with Well 30 serving as a backup well. Future planned deep aquifer groundwater improvements include installing well head treatment, if needed, and completing the above ground features for existing Well 34 and installing a new Well 35 after the year 2020. Figure 4.15-3 presents the historical and projected future annual supply of groundwater from the intermediate and deep aquifers. The sharp drop of projected groundwater supply depicted in Figure 4.15-3 in 2017 coincides with the beginning of wholesale surface water deliveries. During periods of Term 91 curtailments, the groundwater supply depicted in Figure 4.15-3 could be greater than depicted.

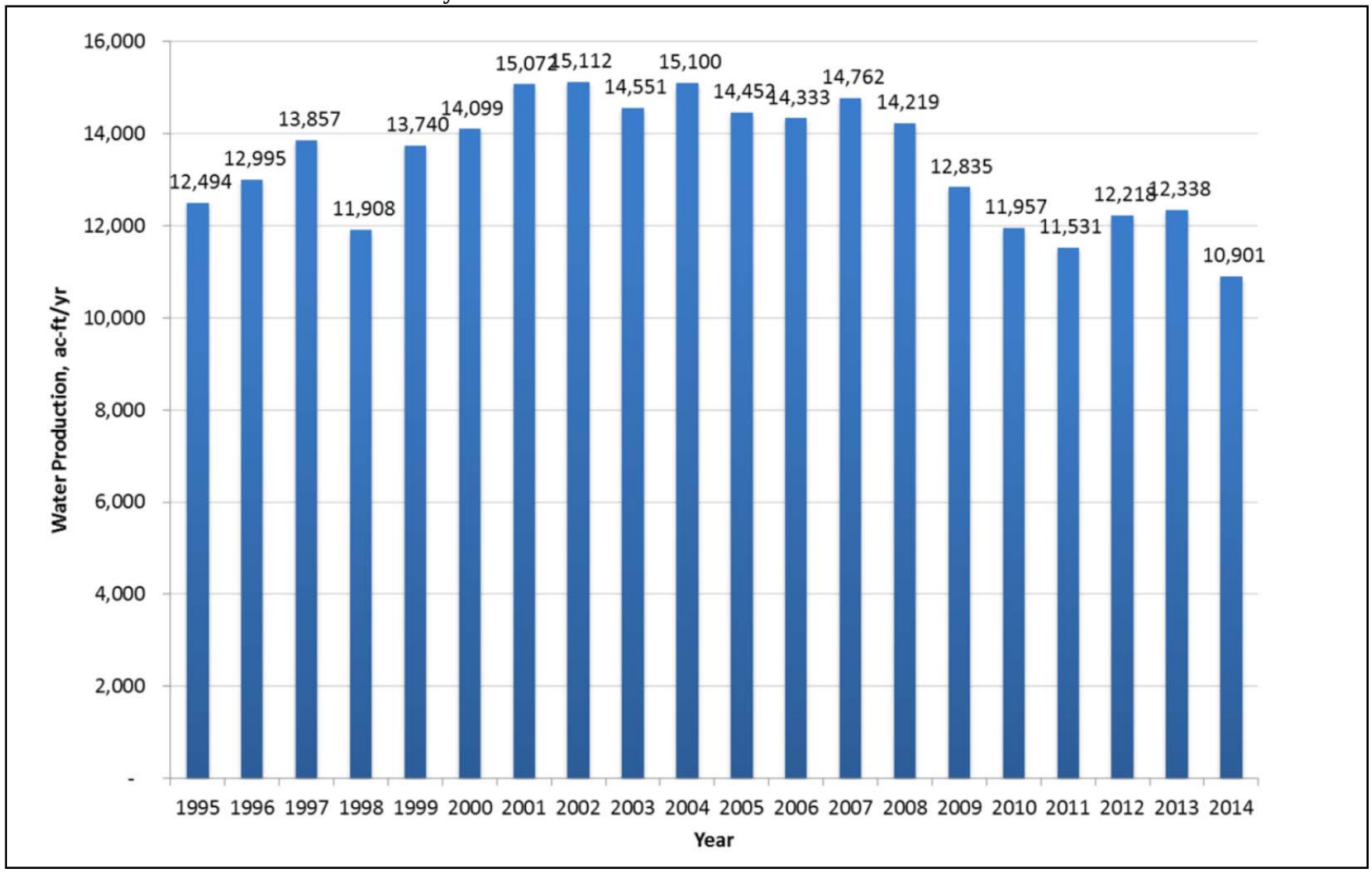
The City's water supply quantity available from groundwater is not impacted by dry, average, or wet years.[10] In dry years the groundwater levels may decline, but this does not reduce the pumping capacity of the City's wells until the groundwater levels drop significantly. The City has an agreement with UC Davis to limit the maximum daily groundwater pumping capacity of the deep aquifer wells. Treatment facilities may be needed on some of the existing deep wells in the future depending on changes in groundwater quality and drinking water standards. Currently, all of the wells meet the drinking water standards.

Wholesale Water Supply

The City of Davis is now under contract to purchase wholesale surface water from the Woodland Davis Clean Water Agency (WDCWA) to use in combination with groundwater from the deep wells. The project participants consist of the City of Davis, City of Woodland, and UC Davis. The facilities are currently under construction and the City estimates the wholesale surface water supply to become available in 2016.

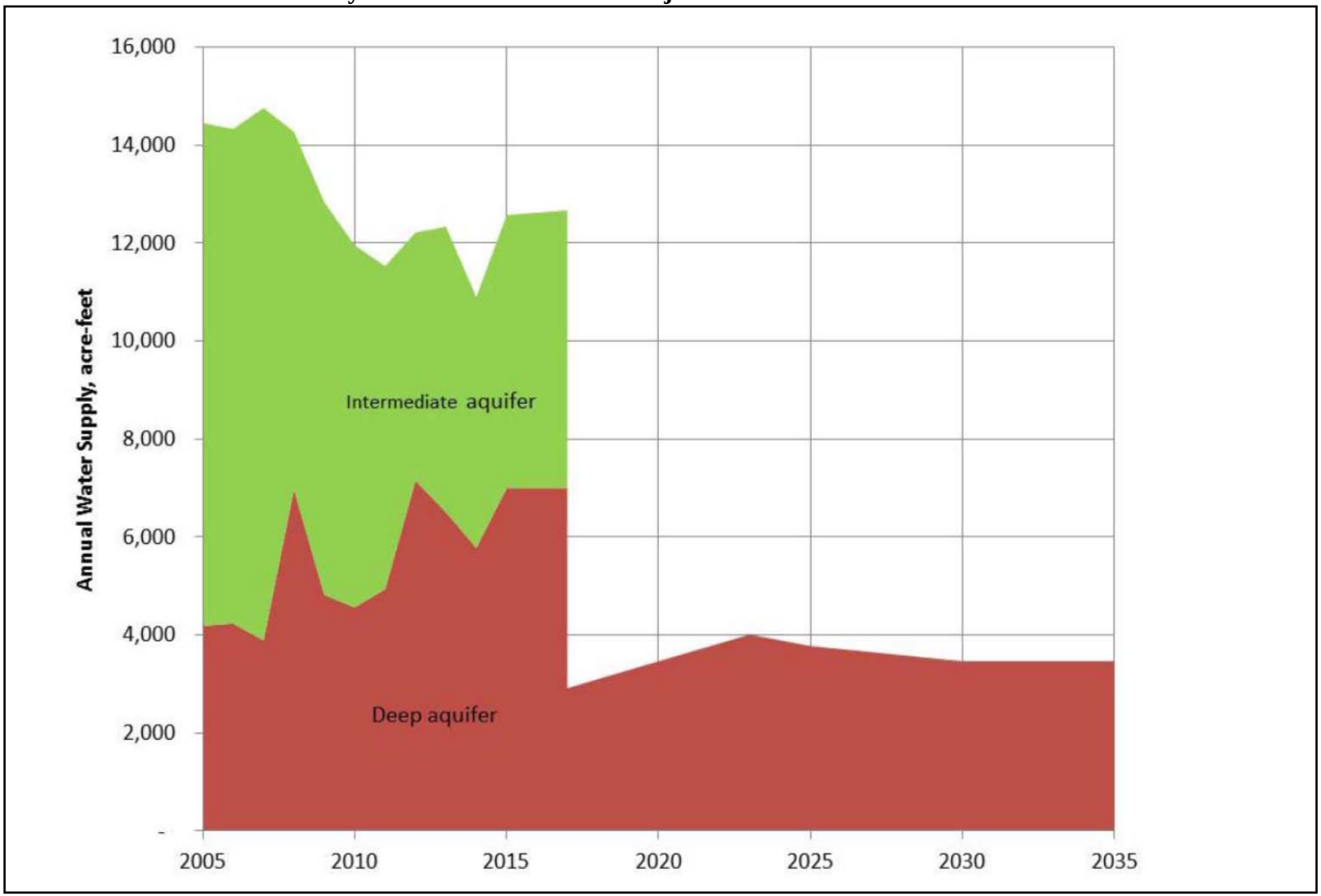
[10] Brown and Caldwell. *Water Supply Assessment [pg. 4-3]*. February 2015.

Figure 4.15-2
City of Davis Historical Annual Water Production



Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Figure 4.15-3
City of Davis Historical and Projected Groundwater Utilization



Source: Brown and Caldwell. Water Supply Assessment. February 2015.

The planned WDCWA surface water treatment plant capacity is 30 mgd. Up to 12 mgd would be conveyed to the City of Davis through a 30-inch diameter transmission pipeline. The City would be supplying up to 1.8 mgd of surface water to UC Davis, which means that the maximum capacity available for the City would be 10.2 mgd.

The WDCWA has two Sacramento River water rights, consisting of a primary water right of 45,000 ac-ft/yr and a secondary right of 10,000 ac-ft/yr. The City's share of this supply would be 18,700 ac-ft/yr, assuming that it is proportional to the share of the proposed treatment plant capacity. The surface water treatment plant capacity would have to be enlarged for the City to be able to fully utilize this amount.

The primary water right is subject to Term 91, which can result in a curtailment of that supply. In the event of a Term 91 curtailment, the secondary water right could be used for the April to October period. When the US Bureau of Reclamation declares a Lake Shasta critical year, the secondary water right is reduced to 7,500 ac-ft/yr. Historically, the majority of Term 91 curtailments have been 3 months or less in duration. 2014 is unique in that it is the first year since the Term 91 regulations went into effect in 1984 that the curtailments have been in effect for most of the year. A Lake Shasta critical year has been declared in 2012, 2013, and 2014, which are three of the seven years of the occurrence of this declaration over the last 40 years.

According to the WSA, the ability of the WDCWA to supply water during drought conditions concludes that 64 and 42 percent of the annual water demands of the project participants would have been met in 2013 and 2014, respectively. 2013 and 2014 represent the two most severe water right curtailment years since Term 91 went into effect in 1984. The WDCWA has the option of purchasing supplemental Sacramento River water from water rights holders not covered by Term 91. The WSA states that the two existing water rights, in combination with deep aquifer groundwater pumping by the City of Davis, an aquifer storage and recovery (ASR) program by the City of Woodland, and the option to purchase supplemental Sacramento River water, are expected to meet the anticipated water demands of all of the project participants. If implemented, an ASR program could counter act the wholesale supply reduction impacts of Term 91 curtailments.

Recycled Water

The City does not use recycled water to supply water demands within the City's water system service area. Therefore, recycled water is not included as a supply source that can be used to help meet demands. The City may decide at a future time to construct the facilities to be able to use recycled water to supply some portion of demands if needed and feasible.

Summary of Water Supplies

The City Council decided in 2013 that the City's long range water portfolio would consist of surface water and groundwater that is supplemented by well conversion/irrigation, ASR,

rainwater catchment, grey water, and storm water, with water conservation to reduce demands.[11] Some of the supplies would not be implemented until sometime in the future, although the ASR option is currently being evaluated by the WDCWA and might be implemented sooner. Surface water and deep aquifer groundwater combined with water conservation comprise the majority of the supply. The analysis assumes that the City would utilize the wholesale surface water supply and the deep aquifer groundwater. Water conservation would continue to be implemented to reduce the City's existing service area per capita water use from the 20x2020[12] target of 167 gpcd to achieve 150 gpcd by 2030. The other water portfolio elements would result in very small amounts of water and is assumed that they would be implemented if needed to provide more potable water supply.

The maximum annual amount available of each water supply available to the City is presented in Table 4.15-1, which does not consider any limitations due to the capacities of existing water system supply facilities and infrastructure.

Table 4.15-1
Annual Amount under Each Water Supply Source

Supply	Contract Amount (ac-ft/yr)	Entitlement	Right	Contract	Ever Used
Groundwater	No Limit[1]		X		Yes
Wholesale Surface Water	18,700[2]			X	No

Notes:
ac-ft/yr = acre feet per year
1. While there is no legal limit on annual pumping, the City has agreed with UC Davis to limit total groundwater pumping capacity.
2. Assume proportional to treatment plant capacity share. The actual amount available to the City will be limited by the capacities of the supply facilities and intermittent Term 91 curtailments.

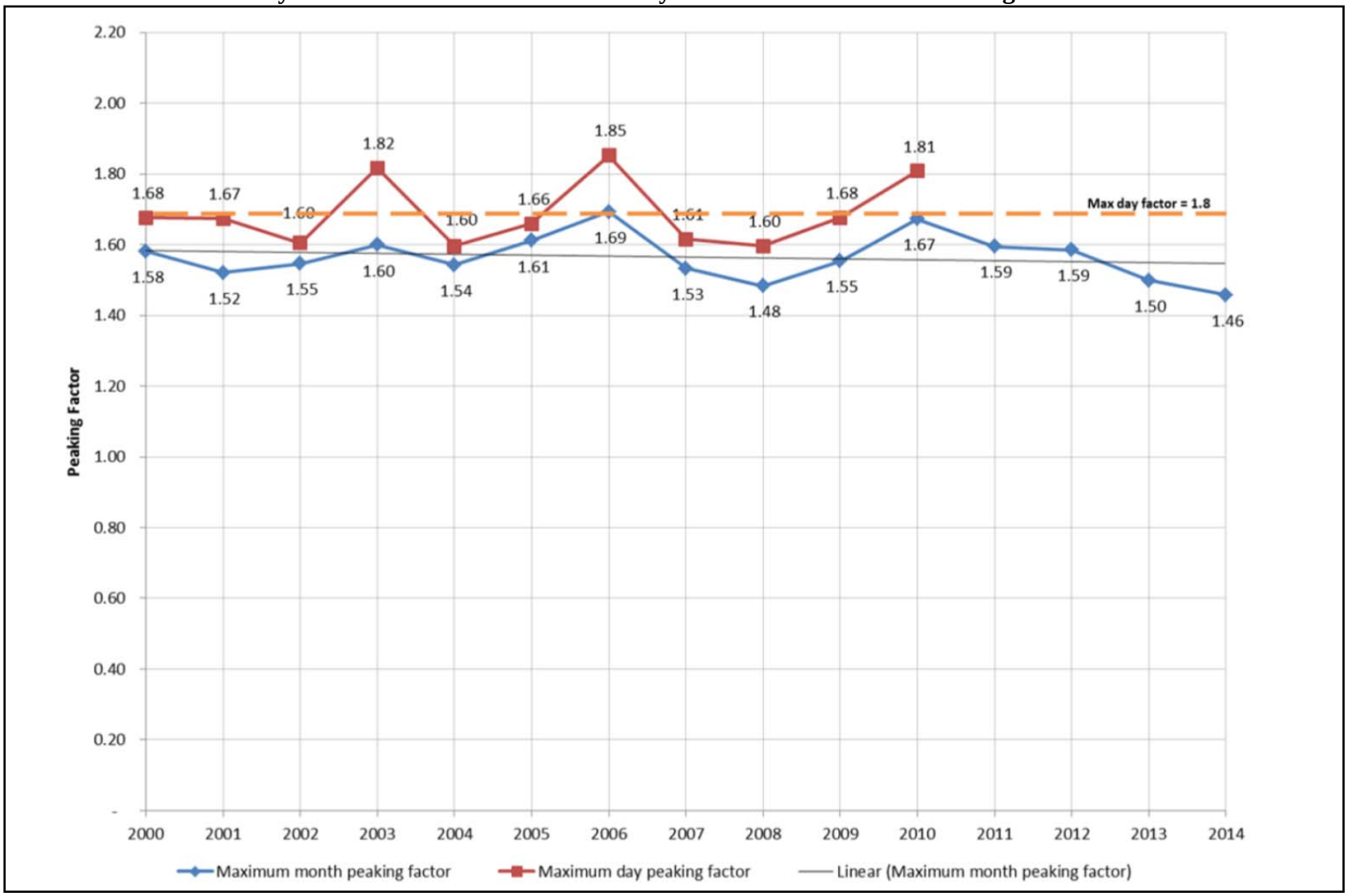
Source: Brown and Caldwell. Water Supply Assessment. February 2015.

The annual amounts of groundwater and wholesale surface water available to the City are limited by the capacities of the water supply infrastructure. The water supply infrastructure is sized to serve the maximum day demand. Figure 4.15-4 presents the City's historical maximum day and maximum month peaking factors.

[11] Brown and Caldwell. *Water Supply Assessment [pg. 4-5[*. February 2015.

[12] State has prepared the 20x2020 Water Conservation Plan (dated February, 2010), which in accordance with Senate Bill X7-7, provides a framework to achieve a 20 percent reduction in per capita water use statewide by 2020. There are four methods that the SBX7-7 legislation defines for establishing a GPCD target. Water agencies have to select one of the methods to establish their 2020 water use target. For the MRIC WSA analysis, it is assumed that the City will select Method 3, which is a 2020 target of 167 GPCD. This equates to ninety-five percent of the applicable state hydrologic region target, as set forth in the state's 20x2020 Water Conservation Plan. Method 3 is the simplest of the methods as it involves looking up a table value for the applicable hydrologic region.

Figure 4.15-4
City of Davis Historical Maximum Day and Maximum Month Peaking Factors



Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Once wholesale surface water becomes available, the City's maximum day supply capacity would be 23.2 mgd, which consists of the 13.2 mgd capacity of the deep aquifer wells and the 10.2 mgd capacity of the wholesale surface water supply. The City would have additional groundwater supply capacity from some of the intermediate depth wells that would be kept for emergency standby purposes. The other wells are assumed not to be normally operational.

The City plans to maximize surface water use by routinely using the surface water supply as a base load and using the deep aquifer wells as a supplemental supply during the summer when demands would exceed the surface water supply capacity. The other bookend would be to maximize the use of groundwater.

Neither of these supplies alone is sufficient to meet all City demands during the peak months, so both supplies are needed. The assessment considered two scenarios, one that maximizes the use of available surface water, and one that maximizes the use of groundwater. The surface water is subject to reductions and curtailment in dry years, but the reduced amount of surface water can be made up by using additional groundwater. Therefore, the supply assessment included both cases, one where the full allotment of surface water is available, so surface water use is maximized; and one where surface water availability is reduced, so groundwater is maximized.

Table 4.15-2 presents the City's maximum day and annual supply capacity and the breakdown of the surface water and groundwater supply amounts for the two operational scenarios.

Table 4.15-2
Water Supply Capacity (mgd)

Water Supply	Maximum Day (mgd)	Annual with Maximum Surface Water (ac-ft/yr)[1]	Annual with Maximized groundwater (ac-ft/yr)[2]
Surface Water	10.2	10,404	2,996
Groundwater	13.2	4,848	12,257
Total	**23.4**	**15,253**	**15,253**

Notes:
1. Annual supplies with maximum use of the wholesale water supply.
2. Annual supplies with maximum use of the City's groundwater wells

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-3 presents the City's monthly and annual use of water supplies with the full use of the City's supply facilities. The 10.2 mgd wholesale water supply capacity would be equivalent to 11,426 ac-ft/yr if the City could utilize the 10.2 mgd year round. However, because of the lower demands in the winter months, the wholesale water supply capacity is 10,404 ac-ft/yr, as shown in Table 4.15-3.

Figure 4.15-5 depicts the historical and projected use of the groundwater and surface water supplies through 2035, as well as the amount of planned water conservation. The amount of water conservation savings is the difference between the 2020 per capita water use target of 167 gpcd and the projected per capita water use in the future.

Table 4.15-3
Monthly Water Supply at Maximum Capacity (mgd)

Month	Provided Supply with Maximized Surface Water[1]			Provided Supply with Maximized Groundwater[2]			Monthly Demand Factor (month/annual water use)
	Surface Water	Groundwater	Total	Surface Water	Groundwater	Total	
January	7.8	-	7.8	-	7.8	7.8	0.047
February	6.9	-	6.9	-	6.9	6.9	0.042
March	8.4	-	8.4	-	8.4	8.4	0.051
April	10.2	1.8	12.0	-	12.0	12.0	0.074
May	10.2	6.1	16.3	3.1	13.2	16.3	0.100
June	10.2	8.4	18.6	5.4	13.2	18.6	0.114
July	10.2	11.5	21.7	8.5	13.2	21.7	0.133
August	10.2	11.3	21.5	8.3	13.2	21.5	0.132
September	10.2	9.1	19.3	6.1	13.2	19.3	0.118
October	10.2	3.6	13.8	0.6	13.2	13.8	0.085
November	9.4	-	9.4	-	9.4	9.4	0.057
December	7.6	-	8	-	7.6	7.6	0.047
Total (ac-ft/yr)	**10,404**	**4,848**	**15,253**	**2,996**	**12,257**	**15,253**	

Notes:
1. Monthly supplies with maximum use of the wholesale water supply.
2. Monthly supplies with maximum use of the City's groundwater wells

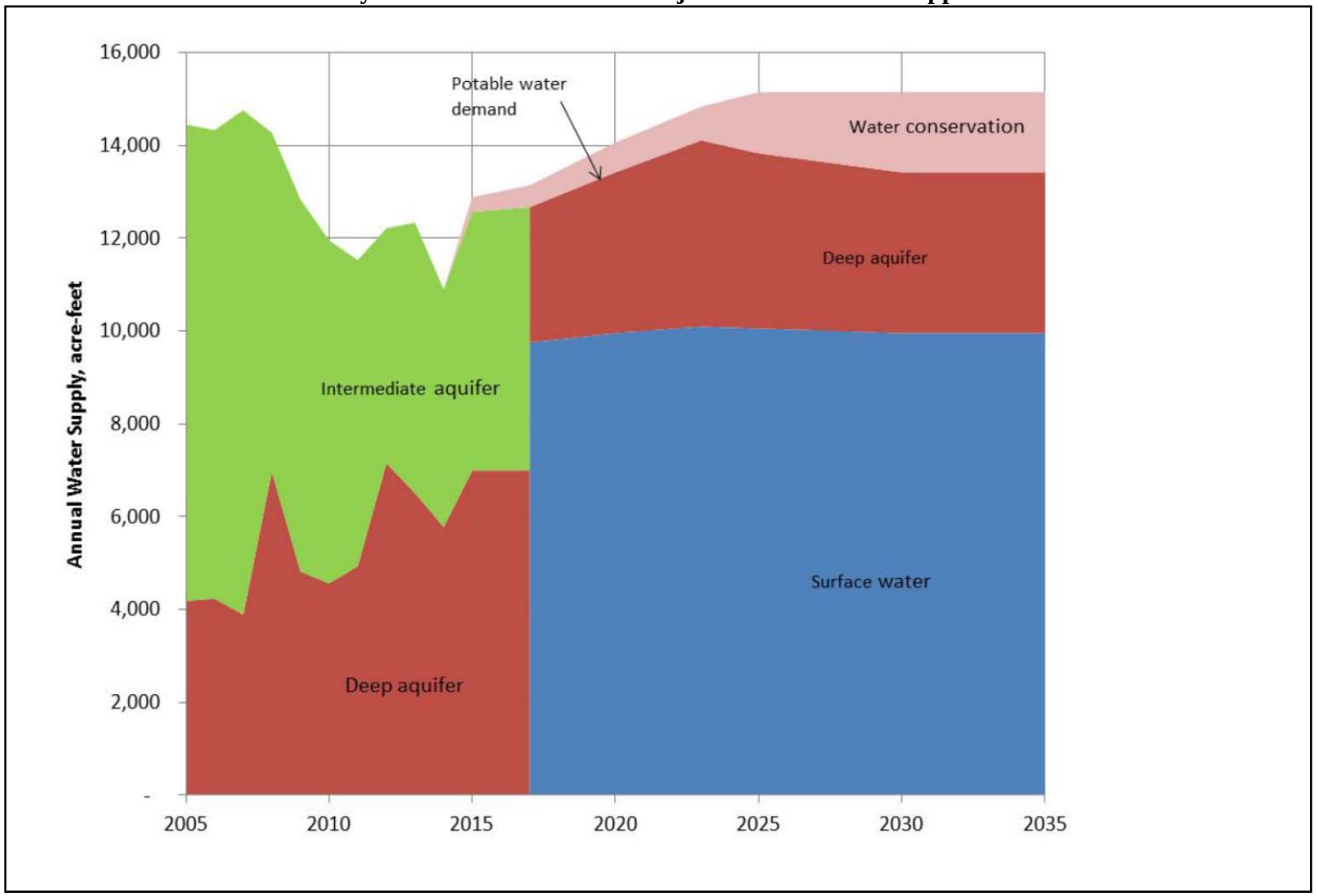
Source: Brown and Caldwell. Water Supply Assessment. February 2015.

The City's actual and projected annual water deliveries for average climate years are summarized in Table 4.15-4. The values represent the projected supply amounts to be used with a maximum surface water use operational approach, as shown in Table 4.15-3. Table 4.15-5 presents the maximum amount of supply available from each source for the different climate year types limited by the capacities of the supply facilities. The projected supply available for the single dry and multiple dry years in Table 4.15-5 assumes an operational mode where the maximum use of the City's groundwater wells is the priority as shown in Table 4.15-3.

The wholesale values in Table 4.15-4 and Table 4.15-5 represent the projected supply deliveries and availability for the average climate years during which Term 91 curtailments do not constrain surface water deliveries below the surface water treatment plant capacity. Under current demand conditions, any curtailments longer than 3 months are likely to reduce surface water deliveries below plant capacity. By 2035, it is possible that a 2-month curtailment would limit deliveries below plant capacity. In the case of Term 91 curtailments during an average climate year, the City would increase the use of the groundwater supply or the wholesale supply amounts would remain the same through the use of the option to purchase supplemental Sacramento River water.

Table 4.15-6 presents the projected dry year supplies in five year intervals through 2035, based on the capacities of the supply facilities, except 2015 is based on the projected use of the existing groundwater supply.

Figure 4.15-5
City of Davis Historical and Projected Use of Water Supplies



Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-4
Projected Deliveries to Meet Projected Demand in Average Climate Years (ac-ft/yr)

Water Supply	2010 (actual)	2015	2020	2025	2030	2035
Wholesaler – WDCWA	-	-	9,955	10,056	9,955	9,955
Supplier Produced Groundwater	11,957	12,574	3,466	3,777	3,466	3,466
Total	**11,957**	**12,574**	**13,421**	**13,833**	**13,421**	**13,421**

Notes:
ac-ft/yr = acre feet per year
1. Projected supply deliveries for the average climate years in which Term 91 curtailments do not constrain surface water deliveries.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-5
Projected Supply Availability by Source for Average, Single-Dry, and Multiple-Dry Years

Water Supply Sources	Average/Normal Water Year Supply (ac-ft/yr)	Single-Dry Year (ac-ft/yr)	Multiple-Dry Years (ac-ft/yr)			
			Year 1	Year 2	Year 3	Year 4
Wholesale – WDCWA[1]	10,404	2,996	2,996	2,996	2,996	2,996
Supplier Produced Groundwater[2]	4,848	12,257	12,257	12,257	12,257	12,257
Total	**15,253**	**15,253**	**15,253**	**15,253**	**15,253**	**15,253**

Notes:
ac-ft/yr = acre feet per year
Projected available supplies constrained by the capacities of the supply facilities as shown in Table 4.15-3.
1. Assume maximum use of wholesale water supply capacity in average years assuming no Term 91 curtailments.
2. Assume maximum use of City's groundwater supply capacity in single dry and multiple dry years. This is the maximum annual capacity of the City's deep aquifer wells.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-6
Projected Dry Year Supply Availability (ac-ft/yr)

	2015	2020	2025	2030	2035
Single-Dry Year	13,328	15,253	15,253	15,253	15,253
Multiple-Dry Years					
Year 1	12,888	15,253	15,253	15,253	15,253
Year 2	13,328	15,253	15,253	15,253	15,253
Year 3	12,951	15,253	15,253	15,253	15,253

Notes:
ac-ft/yr = acre feet per year
Projected available supplies constrained by the capacities of the supply facilities as shown in Table 4.15-3, except 2015 is projected use of the supply.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Gallons per Capita per Day Target

New requirements regarding per capita water use targets are defined in the Water Conservation Act of 2009, which was signed into law in November 2009 as part of a comprehensive water legislation package. Known as Senate Bill (SB) X7-7, the legislation sets a goal of achieving a 20 percent reduction in urban per capita water use statewide by 2020. SB X7-7 requires that retail water suppliers define in their 2010 urban water management plans the gallons per capita per day (gpcd) targets for 2020, with an interim 2015 target.

Water purveyors are required to select one of the four methods that the legislation defines for establishing a gpcd target. The City of Davis selected in the 2010 Urban Water Management Plan (UWMP) the gpcd target determined by Method 3, which results in a 167 gpcd target by the year 2020. The City's per capita water use has been trending downward as shown on Figure 4.15-6. With a 2013 per capita water use of 163 gpcd, the City's per capita water use is already lower than the 2020 target. The estimated 2014 per capita water use of 143 gpcd is even lower, most likely due to the reduction of water use by the City's customers as a response to the drought.

The City's Natural Resources Commission (NRC), through its Water Management Subcommittee, has recommended that the City reduce per capita water use an additional 20 percent from the City's 2020 water use target of 167 gpcd. The NRC's recommended target is 134 gpcd. The Water Supply Assessment (WSA) prepared for the proposed project assumes that the City would achieve 150 gpcd by 2025, which is 10 percent less than the 2020 target. Selecting the midpoint of 150 gpcd between the NRC recommended target of 134 gpcd and the 2020 target of 167 gpcd allows for the possibility that the City is not able to achieve the lower NRC recommended value.

It should be noted that the per capita water use for the City's existing service area is assumed to be 161 gpcd from 2015 to 2020 for the purpose of the demand projections developed for the proposed project's WSA. The per capita water use for the population residing within the existing service area is then assumed to decline to 150 gpcd by 2030.

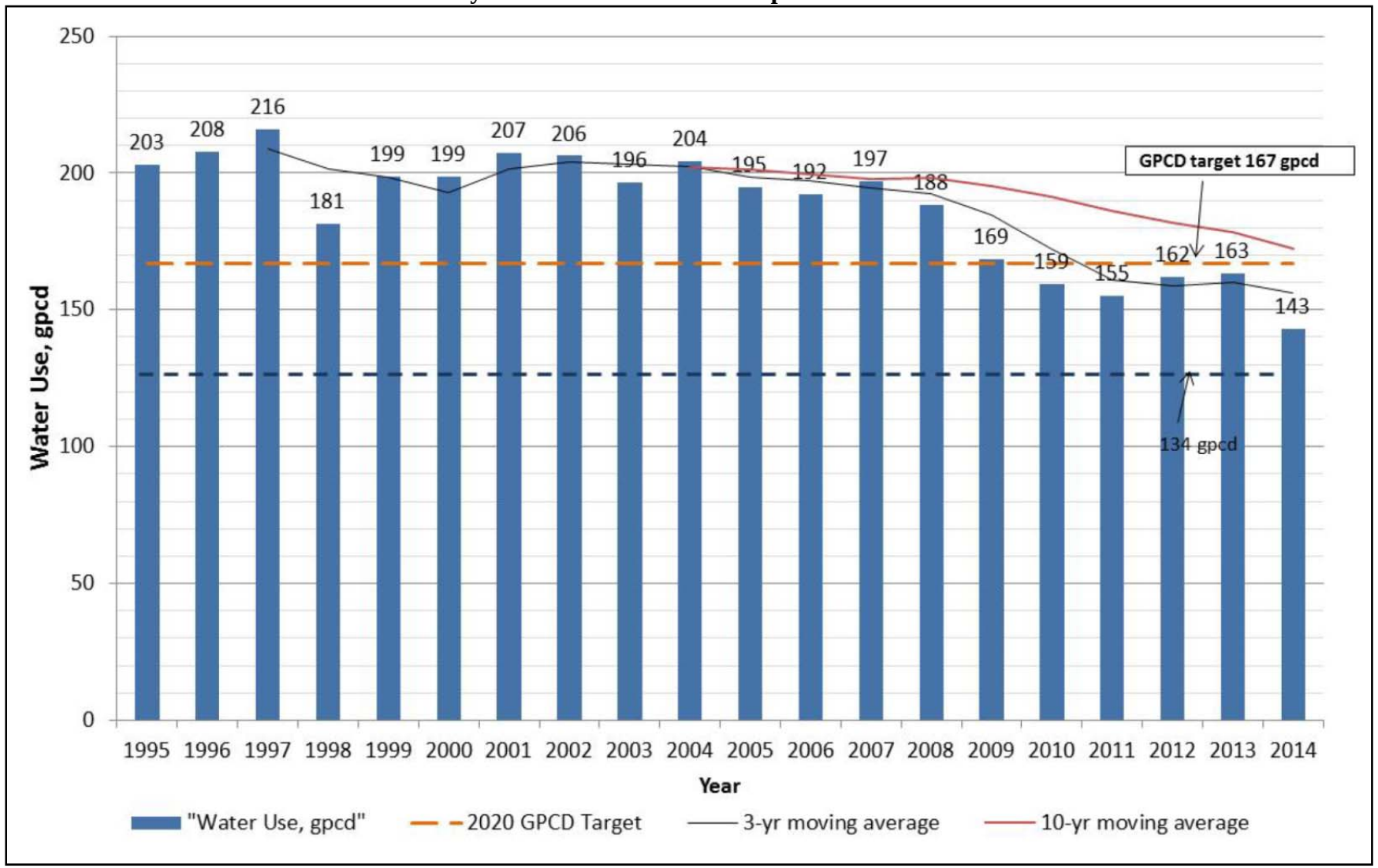
Projected Water Demand

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

Buildout Demand of the Existing Service Area

The number of dwelling units and commercial and industrial acres remaining to be added to the City to reach buildout of the existing service area were provided by the City and are presented in Table 4.15-7. The number of future dwelling units to reach buildout was obtained from the City's housing element update. The additional employment is estimated assuming that the future employees per acre would be 50 percent greater than the City's current average based on the potential employment that could be generated from the remaining commercial and industrial development within the City's current service area.

Figure 4.15-6
City of Davis Historical Per Capita Water Use



Source: Brown and Caldwell. Water Supply Assessment. February 2015. (gpcd = gallons per capita per day)

Any change in the amount of development that would occur within the current service area to reach buildout could change the demand projections developed in this WSA. Table 4.15-7 also presents the calculated employment, population and water system connections for the buildout of the City's current service area. The buildout population of the City's existing water system service area is estimated to be 73,531.

Table 4.15-7
City of Davis Service Area Buildout Demographics

Source	2013	Additional Increment	Buildout
Dwelling Units	26,596	2,231	28,827
Employees	37,500	7,500[1]	45,000
Connections[2]	16,583	980	17,563
Population	67,508	6,023[3]	73,531
Com/Ind Area (acre)	708	116	824

Notes:
1. Employee calculated based on 1.5 times proportional increase in Com/Ind area.
2. Based on 2013 MFR dwelling units/connection and 50 percent increase in 2013 Com/Inst/Ind connections per acre.
3. Based on 2.7 people per dwelling unit.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-8 presents the 2010 and projected future population for the City's existing service area and the proposed developments, which includes the MRIC, Mace Triangle, Davis IC Project, and the Nishi Project, which have all been analyzed as part of the WSA. The projected population is based on the assumption that the City's population located within the current service area will increase 5 percent for every 5-year interval until buildout of the existing service area, as was assumed in previous City water planning documents. The proposed developments are assumed to reach full population by 2025. Of the proposed developments, only the Nishi Project includes residential. The Nishi Project assumes a buildout of 50 percent of the residential population by 2020 with the remaining residential population buildout by 2025. The City would reach buildout of the existing area in approximately 2023 with the assumed growth rate.

Table 4.15-8
City of Davis Service Area Buildout Demographics

	2010	2015	2020	2025	2030	2035
Existing City Service Area	67,005	68,896	71,463	73,531	73,531	73,531
Proposed Developments[1]			878	1,755	1,755	1,755
Total	**67,005**	**68,896**	**72,341**	**75,286**	**75,286**	**75,286**

Notes:
1. Nishi is the only development with a residential component.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

The water demand at buildout of the City's existing water system service area is projected to be 13,258 ac-ft/yr (see Table 4.15-9). 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 ac-ft/yr 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 presented in Table 4.15-8 above and Table 4.15-9 below.

Table 4.15-9
Buildout Water Demands by Water Use Sector – Current Service Area

	2013 Connections	2013 demand (ac-ft/yr)	Additional Connections	gpd/ Connection[1]	Additional Demand to Buildout (ac-ft/yr)	Additional demand at buildout (ac-ft/yr)	Maximum day demand at buildout[3] (mgd)
Single-family	14,516	6,233	815	345[1]	315	6,548	
Multi-family	541	2,618	63	3,888[1]	276	2,894	
Commercial/ Institutional/ Industrial	745	1,577	101	1,890[2]	213	1,791	
Landscape	544	341	0			341	
Other	237	-	0			-	
Subtotal (water sales)	16,583	10,768			804	11,572	
Losses and Unmet Uses		1,568			117	1,685	
Total (water production)		**12,336**			**922**	**13,258**	**21.3**

Notes:
1. Based on a 10 percent reduction of 2013 unit demands.
2. Based on a 50 percent increase of 2013 unit demands.
3. Maximum day demand calculated using a 1.8 peaking factor.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-10 presents the projected water demand in five year intervals of the City's current water system service area by water use sector. As illustrated in Table 4.15-10, 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.

The water use by sector in Table 4.15-10 for the years other than 2023 is estimated by assuming the relative same proportion of sector demands as in 2023.

Water Delivery

According to the Davis UWMP, the City of Davis' 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 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.

Table 4.15-10
Projected Water Demands by Water Use Sector – Current Service Area

Water Use Sector	Projected Water Demand (ac-ft/yr)					
	2015	2020	2023	2025	2030	2035
Single-family	6,332	6,344	6,590	6,285	6,082	6,082
Multi-family	2,659	2,804	2,802	2,777	2,688	2,688
Commercial/ Institutional/ Industrial	1,602	1,735	1,801	1,719	1,663	1,663
Landscape	346	330	343	327	316	316
Subtotal	10,939	11,213	11,534	11,108	10,749	10,749
System Losses	1,635	1,676	1,724	1,660	1,606	1,606
Total	**12,574**	**12,889**	**13,258**	**12,767**	**12,356**	**12,356**

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Pipelines

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

Storage Facilities/Booster Pump Stations

The City's water system has three storage tanks: the existing Elevated Tank, West Area Tank (WAT), and the relatively new East Area Tank (EAT). The three tanks have a combined storage of 8.5 million gallons (MG). The WAT has a booster pumping capacity of 4,200 gallons per minute (gpm); and the EAT has a total pumping capacity of 8,000 gpm. The WAT and EAT fill during off-peak demand periods, and then the booster station pumps send water back into the system during peak periods based on time and system pressure.

Interties

The City is connected to the UC Davis water system via two interties. As mentioned above, UC Davis entered into a water supply agreement with the City on July 9, 2010, and it is in effect through June 30, 2016. The water supply agreement limits the City from normally receiving water supply in excess of 300,000 hundred cubic feet (CCF) per year, with a flow rate not to exceed 1,500 gpm from UC Davis. During an emergency, the flow rate may exceed 1,500 gpm if both parties agree to the increased flow rate.

Under normal operations, UC Davis's system pressure exceeds the City's system pressure, therefore the water will only flow towards the City. If the UC Davis system pressure drops below the City's system pressure, such as during an emergency, the interties can provide water from the City to UC Davis.

Water System Facilities within Project Site Vicinity

Existing water facilities adjacent to the MRIC site include a 12-inch City of Davis water main located in Mace Boulevard, and the City's recently constructed 4 MG Southeast Water Tank and booster pumping station located just south of the project site. The pumping station discharges to a 20-inch pipe, which traverses adjacent the Park-and-Ride lot and connects to existing distribution piping in Mace Boulevard near the intersection of Mace and 2nd Street.

Existing 12-inch water lines are located within Mace Boulevard, along the project frontage, and along 2nd Street and Alhambra Boulevard. An existing 20-inch water line is located within the park-and-ride lot at the Mace Triangle site.

Wastewater Collection and Treatment

The City of Davis provides wastewater conveyance and treatment for all residents and businesses within the City of Davis and two unincorporated areas: North Davis Meadows (north of Davis at State Route [SR] 113 and County Road [CR] 29), and El Macero (south of Davis adjacent to the southern City boundary).

Wastewater Treatment Plant Capacity

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 is currently being upgraded to ensure compliance with all existing and anticipated wastewater discharge standards, and has an anticipated completion date of Fall 2017. The City's WWTP upgrade project includes 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 is being accomplished in two phases: Rehabilitation and Replacement (R&R) Phase and Secondary and Tertiary Improvements (STI) Phase, the first of which is already complete and the second of which has been approved and funded.

Secondary and Tertiary Improvements (STI) Phase – Projected Completion date of Fall 2017

The following secondary and tertiary WWTP improvements have been approved and funded:

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

The WWTP would be 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. A summary of the ADWF values for the past five calendar years is presented in Table 4.15-11.

Table 4.15-11
Davis WWTP Influent ADWF and BOD Values, 2010-2014

Year	ADWF (mgd)	BOD (mg/L)	BOD (lbs/day)	Months
2010	4.55	198	7,500	July–September
2011	4.71	205	8,100	August–October
2012	4.26	230	8,200	July–September
2013	4.42	205	7,600	July–September
2014	3.78	258	8,100	July–September
5-Year Average	**4.34**	**219**	**7,900**	-
Coefficient of variation[1]	8.2%	11.4%	4.1%	-

Notes:
mgd = million gallons per day
mg/L = milligrams per liter
lbs/day = pounds per day
1. Defined as the standard deviation divided by the arithmetic mean; indicates the degree of variability in the data.

Source: West Yost Associates. Impacts of Innovation Center/Nishi Property Development on Wastewater Treatment Plant Capacity. Technical Memorandum (Final). April 2, 2015.

As indicated in Table 4.15-11, the 5-year average of ADWF values for the period of 2010–2014 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, for this analysis, the 5-year average ADWF value for the period of 2010–2014 (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, once 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.[13]

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.[14] 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 2010–2014 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, as shown in Table 4.15-11 above. However, given the variability in the BOD 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, upon completion of the WWTP upgrade project in Fall 2017.

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

Wastewater Collection System

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 CR 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.[15]

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. 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.

Wastewater Collection System Facilities in Project Site Vicinity

The nearest existing City sewer main is an 8-inch line located in Mace Boulevard, adjacent to the MRIC project site to the west. An existing City 42-inch trunk main is also located just over a half-mile north of the project site. In addition, an existing 21-inch main, servicing the El Macero development runs approximately one half-mile east of the project site in CR 105.

Solid Waste Disposal

Solid waste collection and disposal in the City of Davis is provided by Davis Waste Removal, Inc. Davis Waste Removal has a drop-off and buy-back center and provides residential curbside, apartment, and business collection services. In addition to the weekly garbage service, Davis Waste Removal 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.

All non-recyclable waste generated by the City of Davis is disposed of at the 770-acre Yolo County Central Landfill, which is located off CR 28H, near its intersection with CR 104. The landfill is owned and operated by the Yolo County Department of Public Works and Transportation. According to the City of Davis Integrated Waste Management Plan, the landfill is not operating at capacity and has a current anticipated closure date of 2081.[16] The remaining capacity at the Yolo County Central Landfill is approximately 36,555,700 cubic yards.[17] Under the landfill's existing permit, the facility is allowed to receive up to 1,800 tons per day, 299 days a year. Currently, the landfill averages approximately 1,000 tons of solid waste disposed per day.[18] The landfill also includes a recycling drop-off facility, a wood processing facility, and a

[15] City of Davis. *Sewer System Management Plan.* August 2012.
[16] City of Davis. *Davis Integrated Waste Management Plan [pg. 13-119]*. July 2013.
[17] Personal email communication between Elise Carroll, Associate at Raney Planning & Management Inc. and Marcus Santillano, Environmental Scientist at the California Department of Resources Recycling and Recovery (CalRecycle) Permits and Assistance, North Central Section. March 23, 2015.
[18] City of Davis. *Davis Integrated Waste Management Plan [pg. 13-119]*. July 2013.

methane gas collection facility, and accepts drop-offs of household hazardous waste at no charge to County residents on designated Saturdays throughout the year.

Electricity and Natural Gas

Gas and electric service in the City of Davis is provided by Pacific Gas & Electric (PG&E) under a franchise granted to PG&E by the City. Existing gas lines are located adjacent to the MRIC site to the west, within the Mace Boulevard right-of-way, and to the south near the Amtrak rail line right-of-way.

Telecommunications

Businesses in Davis subscribe to a mix of wireline providers and resellers including AT&T of California, Comcast, and Omsoft. A few businesses also utilize fixed wireless providers, including DigitalPath, Inc. and Succeed.net. In general, these services are branded as "business class" and come with a higher quality of service that prioritizes business services over residential services that run across the same physical infrastructure.

Big data companies have provided evidence of how their broadband services were inadequate to process the large amounts of data needed to run their operations. [19] Many local companies are small in terms of employees but have large data needs because they utilize significantly more bandwidth than larger companies in other industries. The University also spawns a significant amount of new startups in Davis. As these startups move from the University setting to "off campus," they encounter a reduction in broadband capabilities.

The vast majority of businesses responding to surveys utilized DSL and cable services because they could not afford other services or the services were not available in the area. Apart from these two organizations, use of fiber-optic broadband was not reported by Davis' businesses.

The City currently maintains fiber-optic connectivity between its major sites as part of its renewed cable services Franchise Agreement with Comcast, Davis' local cable provider. The franchise agreement was renewed on October 1, 2005 and expires on September 30, 2018. The Franchise Agreement details the services, terms, conditions and payments that will be made between the City of Davis and Comcast. As part of the negotiated agreement, Comcast has provided 6-strands of fiber to 22 "Major Facilities" throughout the City. It also connects three Yolo County facilities that are within the City of Davis, which provides interconnection with the greater Yolo County fiber network. The Comcast network, known as the "I-Net" or Institutional Network, enables the City to provide connectivity for municipal operations, utilities, public safety, and general administration.

[19] Magellan Advisors, LLC. *Final Yolo Broadband Strategic Plan*. March 26, 2015, p. 51.

4.15.3 REGULATORY CONTEXT

The following discussion contains a summary review of regulatory controls pertaining to utilities, including federal, State, and local laws and ordinances.

Federal Regulations

The following are the federal environmental laws and policies relevant to utilities.

Safe Drinking Water Act (SDWA)

The federal SDWA, which was enacted in 1974, gives the United States Environmental Protection Agency (EPA) the authority to set standards for contaminants in drinking water supplies. The EPA was required to establish primary regulations for the control of contaminants that affected public health and secondary regulations for compounds that affect the taste, odor, and aesthetics of drinking water. Accordingly, the EPA set a maximum contaminant level or treatment technique for each of the 83 contaminants in drinking water listed in the SDWA. Under the provisions of SDWA, the California Department of Health Services (DHS) has the primary enforcement responsibility. Title 22 of the California Administrative Code establishes DHS authority, and stipulates State drinking water quality and monitoring standards.

State Regulations

The following are the State environmental laws and policies relevant to utilities.

State Water Resources Control Board

Executive Order B-29-15

On April 1, 2015, the Governor of California proclaimed a continued state of emergency directing the SWRCB to enhance emergency regulations adopted in 2014 and reaffirmed on March 17, 2015. The Governor's Executive Order B-29-15 sets 2013 as a base year and directed the SWRCB to impose restrictions to achieve a statewide 25 percent water reduction through February 28, 2016.

On May 5, 2015, the State Water Resources Control Board adopted an emergency regulation requiring an immediate 25 percent reduction in overall potable urban water use statewide in accordance with the Governor's April 1, 2015 Executive Order. Based upon the City of Davis' average residential gallons per capita per day usage between July-September 2014, the City's total potable water production must be reduced by 28 percent for each month as compared to the amount used in the same month in 2013. Beginning June 1, 2015, the City of Davis shall comply with this conservation standard.

Senate Bill 610

The California Water Code requires coordination between land use lead agencies and public water purveyors. The purpose of this coordination is to ensure that prudent water supply planning has been conducted and that planned water supplies are adequate to meet both existing demands and the demands of planned development.

Water Code Sections 10910 – 10915 (inclusive), sometimes referred to as SB 610, require land use lead agencies: 1) to identify the responsible public water purveyor for a proposed development project, and 2) to request from the responsible purveyor, a "Water Supply Assessment" (WSA). The purposes of the WSA are (a) to describe the sufficiency of the purveyors' water supplies to satisfy the water demands of the proposed development project, while still meeting the current and projected water demands of customers, and, (b) in the absence of a currently sufficient supply to describe the purveyor's plans for acquiring additional water. Water Code Sections 10910-10915 delineate the specific information that must be included in the WSA.

According to CEQA Guidelines Section 15155, the proposed project meets the criterion of a commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space; therefore, is considered a "water-demand project".

Water Conservation in Landscaping Act of 2006

The Water Conservation in Landscaping Act of 2006 (Assembly Bill [AB] 1881) enacts many, but not all of the recommendations reported to the Governor and Legislature in December 2005 by the CUWCC Landscape Task Force. AB 1881 requires DWR, not later than January 1, 2009, by regulation, to update the model ordinance in accordance with specified requirements, reflecting the provisions of AB 2717. AB 1881 requires local agencies, not later January 1, 2010, to adopt the updated model ordinance or equivalent or it will be automatically adopted by statute. Also, the bill requires the Energy Commission, in consultation with the department, to adopt, by regulation, performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

Sustainable Groundwater Management Act

The DWR has developed a Strategic Plan for its Sustainable Groundwater Management (SGM) Program. DWR's SGM Program will implement the new and expanded responsibilities identified in the 2014 Sustainable Groundwater Management Act (SGMA). The expanded responsibilities include the following:

1) Developing regulations to revise groundwater basin boundaries;
2) Adopting regulations for evaluating and implementing Groundwater Sustainability Plans (GSPs) and coordination agreements;
3) Identifying basins subject to critical conditions of overdraft;

4) Identifying water available for groundwater replenishment; and
5) Publishing best management practices for the sustainable management of groundwater.

Local Regulations

The following are applicable local regulations related to the proposed project.

Davis General Plan

The applicable Davis General Plan goals, policies, and standards related to utilities are presented below in Table 4.15-28.

City of Davis 2010 Urban Water Management Plan

In July 2011, the City of Davis prepared the UWMP, as required by the Urban Water Management Planning Act of 1983, and the City is updating the UWMP in 2015. The focus of the UWMP 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 UWMP 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 UWMP contains best management practices for efficient water use.

Davis Municipal Code

The Davis Municipal Code ordinances related to utilities that are applicable to the proposed project are presented below.

Article 40.42 Water Efficient Landscaping

The purpose of the landscaping standards contained in this article is to comply with the Water Conservation in Landscaping Act of 2006, Government Code Sections 65591 et. seq. and to establish standards and procedures that promote the design, installation and management of water efficient landscaping. These standards may be reviewed and updated, as required.

Section 40.42.020 Applicability.

(a) The provisions of this article shall apply to all of the following landscape projects within the City of Davis, except as otherwise noted:
    (1) Non-Residential Projects and Public Agency Projects. New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than two thousand five hundred square feet requiring a building or landscape permit, plan check or design review.

Section 40.42.050 Provisions for new construction or rehabilitated landscapes.

(a) Prior to construction or issuance of permits, the project applicant for a new construction or rehabilitated landscape project, as described in Section 40.42.020, shall submit a complete landscape documentation package to the department of community development and sustainability for review and approval.

(b) Upon approval of the landscape documentation package by the department of community development and sustainability, the project applicant shall:
   (1) Receive a permit or approval of the plan check or design review and record the date of the permit in the certificate of completion; and
   (2) Submit a copy of the approved landscape documentation package along with the record drawings, and any other information to the property owner or designee.

(c) Upon completion of the landscape project and prior to final of the permit or occupancy, the project applicant shall submit a completed certificate of completion, as described in Section 40.42.120, to the department of community development and sustainability for review and approval.

4.15.4 IMPACTS AND MITIGATION MEASURES

The section below describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential project-specific impacts related to utilities. In addition, a discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

In accordance with Appendix G of the CEQA Guidelines, impact determinations regarding utilities require consideration as to whether the proposed project would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs;

- Fail to comply with federal, state, and local statutes and regulations related to solid waste; or
- Conflict, or create an inconsistency, with any applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects related to utilities.

Issues Not Discussed Further

The proposed project's impact associated with storm water drainage facilities is addressed in Section 4.9, Hydrology and Water Quality, of this EIR. Please refer to Section 4.9 for a detailed discussion of this topic.

Method of Analysis

The Impacts and Mitigation Measures section evaluates the impacts of the proposed project on existing utilities, which could occur if the project is developed as currently proposed. Impact significance is determined by comparing project conditions to the existing conditions.

Water Supply Assessment

The WSA prepared for the City of Davis Public Works Department by Brown and Caldwell, documents the projected water demands associated with the proposed Innovation Center projects, as well as the Nishi Project. SB 610 and 221 require that water assessments be included in environmental documentation for certain projects and an affirmative written verification of sufficient water supply for approval of certain development, respectively. Applicable developments are those that would have a water demand that would be equivalent or greater than the amount of water used by a 500 dwelling unit project or would increase the number of service connections by at least 10 percent. The WSA is performed in conjunction with a project's land-use approval process and must include an evaluation of the sufficiency of the water supplies available to the water supplier to meet existing and anticipated future demands including the demand associated with the proposed developments. The evaluation must cover a 20-year period and address normal-, single-dry, and multiple-dry climate years.

The WSA must identify any existing water supply entitlements, water rights, or water service contracts held by the water supplier or relevant to the identified water supply for the proposed project. If the public water supplier relies on groundwater supplies, the WSA must describe the groundwater basins from which the proposed project will be supplied. For each basin that has not been adjudicated, the assessment should indicate whether the DWR has identified the basin as overdrafted or has projected that the basin would become overdrafted.

The WSA prepared for the for the proposed project calculates the buildout demand of the City's current water system's service area, and the water demand associated with the proposed MRIC, Mace Triangle, Davis IC Project, and the Nishi Project. The total anticipated demand is compared to water supplies to determine the sufficiency of water supplies to serve the projected needs during normal year, single-dry, and multiple-dry year scenarios.

Proposed Project Water Supply Assumptions (MRIC and Mace Triangle)

Brown and Caldwell made the following assumptions when calculating project water demands (further details regarding water demand factors used to calculate the project's water demand are included in Appendix K to this EIR, Water Supply Assessment):

1. Assume hotel has 150 rooms.
2. 20 percent of MRIC site outdoor irrigation demand supplied by the City, while the rest is provided by on-site well. All of Mace Triangle site irrigation demand supplied by the City.
3. Unit demand factors
   a. gpd/acre – 70 percent of effective evapotranspiration (ETO). ETO and precipitation based on the July 1982 to January 2011 average for CIMIS Sacramento Valley, Davis Station 6.
   b. gpd/employee (indoor) – Based on 2013 indoor CII use.
   c. gpd/room – typical usage.
4. Average annual demand
   a. Average annual hotel room demand is 80 percent of maximum day demand (MDD) which is based on an assumed average 80 percent occupancy.
   b. Average annual convention center visitor demand is based on the assumption that the convention facilities will be fully utilized 15 weeks out of the year, which is approximately 30 percent of the year.
5. Maximum day demand
   a. Indoor peaking factor – used for office and retail. Assumed to be 30 percent greater than average day demand.
   b. Hotel guest rooms –Unit demand factor for hotel room is used to calculate the MDD for hotel rooms at full occupancy.
   c. Convention center people (attendees) – MDD based on full occupancy. No peaking factor for convention center visitors.
   d. Outdoor landscape – peak day application rate is based on 70 percent of the maximum month ETO.

As noted in the above assumptions, the WSA assumes that 20 percent of MRIC site outdoor irrigation demand would be provided by the City and all of Mace Triangle site irrigation demand would also be provided via the City's water system. The applicant has indicated an interest in installing an on-site non-potable well in the west-central portion of the site, within the proposed park area, adjacent Mace Boulevard. The irrigation well will serve the proposed park and recreation field area as well as other open-space areas on-site, using a dedicated irrigation distribution piping system. It may also be used for irrigating street landscaping within the proposed street corridors on-site, as well as other public common areas. As an alternative to installing a new irrigation well, the project may utilize an existing agricultural well, provided it proves adequate for the intended use. This proposal, and its potential effects to groundwater, are addressed in Section 4.9, Hydrology and Water Quality, of this EIR.

Water Infrastructure Study

Brown and Caldwell performed a hydraulic model analysis of the impacts on the City's existing water system, which could result from the proposed project. The peak hour pressures and maximum velocities in the system were evaluated with the City's current service area at buildout and with the addition of the buildout demands for the proposed project.

Wastewater Collection

West Yost and Associates prepared a technical memorandum for the City of Davis Public Works Department, which presents an assessment of the impacts of the proposed project on the City of Davis wastewater collection system.

In general, where direct flow measurements were unavailable, existing and future collection system flows were estimated based on the use of sewer flow factors in combination with existing and proposed land use information. For sewer lines, the key flow condition of interest is instantaneous peak wet weather flow (PWWF), which represents the worst-case flow condition that is likely to occur. The major steps in the estimation of the PWWF for any point in the collection system include:

1. Estimate the ADWF, which involves quantifying existing and future development conditions and applying appropriate flow factors to those quantities.
2. Estimate the instantaneous PDWF, which involves applying a suitable dry weather peaking factor to the ADWF.
3. Estimate the peak instantaneous infiltration and inflow (I&I) rate into the collection system associated with worst-case wet weather conditions. The PWWF is the sum of the PDWF and the peak instantaneous I&I.

Sewer flow factors in gpd per unit, as taken from the City's 2012 Sewer System Management Plan (SSMP), are summarized in Table 4.15-12.

An alternative means of arriving at an estimate of ADWF for the projects in question involves the use of indoor water use estimates obtained from the WSA prepared for the proposed project. West Yost included these estimates in the Wastewater Collection System Technical Memo prepared for the IC and Nishi projects for comparison purposes.

The City of Davis 2009 System Evaluation and Capacity Assurance Plan (SECAP) mandates that the depth of flow (d) associated with the PWWF condition should not be more than 75 percent of the pipe diameter (D). This d/D ratio of 0.75 equates to a flow ratio of 90 percent. In other words, a trunk sewer should be considered at capacity if the PWWF is 90 percent of the full-pipe gravity flow capacity of that pipe.

Table 4.15-12
Davis Sewer Flow Factors

Description of Source	Type of Use	Unit	Flow Factor (gpd/unit)
Auto Service Station	Commercial	Employee	15
Auto Service Station	Commercial	Auto	11
Bar	Commercial	Customer	2
Bar	Commercial	Employee	15
Country Club	Recreation	Member	55
Hospital	Industrial	Bed	175
Hospital	Industrial	Employee	15
Hotel	*Commercial*	*Employee*	*15*
Hotel	*Commercial*	*Guest*	*55*
Industrial Offices	Commercial	Employee	15
Laundry (self-serve)	Commercial	Machine	600
Laundry (self-serve)	Commercial	Wash	55
Motel	Commercial	Employee	15
Motel	Commercial	Guest	35
Motel with Kitchens	Commercial	Guest	55
Office (Typical)	Commercial	*Employee*	15
Residential, Single-family	*Residential*	*Unit*	*330*
Residential, Multiple-family	*Residential*	*Unit*	*230*
Restaurant	Commercial	Meal	4
Retail (Typical)	*Commercial*	*Employee*	*15*
Retirement Home	Industrial	Employee	15
Retirement Home	Industrial	Resident	110
School	Industrial	Student	11
School with Cafeteria	Industrial	Student	16
School with Cafeteria and Gym	Industrial	Student	21
Shopping Center	Commercial	Employee	15
Shopping Center	Commercial	Toilet	550
Theater	Commercial	Seat	3

Notes:
gpd/unit = gallons per day per unit
Italicized entries denote land uses with immediate relevance to the proposed projects.

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

Wastewater Treatment

West Yost and Associates prepared a technical memorandum for the City of Davis Public Works Department to accomplish the following objectives: 1) the technical memo evaluates the existing WWTP capacity, and 2) estimates the wastewater generation from General Plan buildout, and buildout of proposed projects, including the two innovation center projects, and the Nishi Project. The wastewater treatment analysis used the following three methodologies:

- Indoor Water Use Basis
- Land Use and Sewer Flow Factor Basis

- BOD Loading Basis

Project Impacts and Mitigation Measures

The following discussion of impacts is based on implementation of the proposed project in comparison with the standards of significance identified above. The discussions and mitigation measures presented below apply to both the MRIC and the Mace Triangle portions of the proposed project unless otherwise stated.

4.15-1 Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. Based upon the analysis below, the impact is *less than significant*.

Pursuant to federal regulations, 40 CFR 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard. The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. Per the City of Davis' current WWTP Order and NPDES Permit from the State Water Resources Control Board (Order R5-2013-0127; NPDES NO. CA0079049), specific effluent limitations have been set for the two WWTP discharge points.

The federal CWA section 307(b), and federal regulations, 40 CFR Part 403, require publicly owned treatment works to develop an acceptable industrial pretreatment program. A pretreatment program is required to prevent the introduction of pollutants, which will interfere with treatment plant operations or sludge disposal, and prevent pass through of pollutants that exceed water quality objectives, standards or permit limitations.

The City of Davis Pretreatment Program requires businesses to provide necessary wastewater treatment as required to comply with this article, and shall achieve compliance with all national pretreatment standards. Detailed plans showing the pretreatment facilities and operating procedures shall be submitted to the general manager for review, and shall be acceptable to the general manager before construction of the facility.

As a result of the City's Pretreatment Program, prior to operation of each building within the innovation center, the City will review each proposed business' wastewater system to ensure that it will not impede the City's ability to meet its wastewater treatment requirements approved by the Regional Water Quality Control Board in Order R5-2013-0127. Therefore, the proposed project would have a ***less-than-significant*** impact related to exceeding wastewater treatment requirements of the applicable Regional Water Quality Control Board.

Mitigation Measures
None required.

4.15-2 Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed. Based on the analysis below, the impact is *less than significant.*

The following water supply impact discussion will consider the project's water demand in conjunction with demand from other cumulative buildout over a 20-year horizon. While this approach reflects a typical cumulative discussion, it is appropriate in this case because arranging the project-level impact discussion in this way enables the reader to see how the discussion corresponds to the analytical requirements of SB 610.

Water Supply

Projected Demands of the Proposed Developments

The buildout water demands for the MRIC and the Mace Triangle are shown in Table 4.15-13 and Table 4.15-14, respectively. The proposed MRIC's and Triangle's potable water demand would be provided entirely by the City's water supply system. With respect to irrigation water, approximately 80 percent of the non-potable, irrigation water demand for the MRIC would be provided by an on-site irrigation well, with the remaining 20 percent provided by the City's potable water system. The future landowners and users at the MRIC may also desire to utilize recycled water if and when it is made available from the City's WWTP. In order for recycled water to be provided to the MRIC, off-site distribution infrastructure would need to be installed from the WWTP to the project site. While this off-site distribution infrastructure is not proposed by the MRIC applicant, the applicant has proposed to install recycled water/purple pipe infrastructure within the MRIC, with pipe stubs at the property boundaries, in the event that the City, or another entity, constructs this infrastructure at some future date. Should the necessary off-site infrastructure be installed, recycled water from the City's WWTP can be supplied to the site at a future date.

One hundred percent (100%) of the Mace Triangle's irrigation water demand will come from the City's potable system.

The projected buildout annual and maximum day demands of the City's current service area and of the proposed developments are summarized in Table 4.15-15. The buildout of the City's current service area and the proposed developments[20] is projected to occur in the range of 2023 to 2025 based on the assumed total population growth rate and the completion of the proposed developments in 2025. The buildout demand of the City's existing service area is projected to decline as the per capita water use within the current service area drops to 150 gpcd.

[20] I.e., defined above as Davis IC Project, MRIC Site, Mace Triangle Site, and the Nishi Project.

Table 4.15-13
MRIC Site Buildout Demand

Land Use	Developer Provided Information			Visitors/ Guests	Unit Demand Factors			Average Annual Demand					Maximum Day Demand					
	Acres or square feet	Employees/ People	Rooms		gpd/ acre[1] or gpd/1,000 sq ft	gpd/ employee or visitor (indoor) gpd/ roomc	gpd/ room[3]	Indoor Demand (gpd)	Outdoor Demand - supplied by City[4] (gpd)	Outdoor Demand - supplied by Other (gpd)	Total Demand - Supplied by City, (gpd)	Total Demand - supplied by City (acft/yr)	Indoor Peaking Factor	Indoor MDD (gpd)	Peak day Application[4] (in/day)	Outdoor MDD – Supplied by City (gpd)	Outdoor MDD – Supplied by Other (gpd)	Total MDD – Supplied by City (gpd)
Office		5,633				15		84,495			84,495	95	1.3	109,844				109,844
Non-Office	884,000				90			79,560			79,560	89	1.0	79,560				79,560
Retail		200				15		3,000			3,000	3	1.3	3,900				3,900
Retail Customers				2,482		3		8,526			8,526	10	1.0	8,526				8,526
Hotel – Guest Rooms			150				150	18,000			18,000	20		22,500				22,500
Convention Center[2]				667		15		3,002			3,002	3		10,005				10,005
Hotel – Employee/Common Areas		50				15		750			750	1	1.3	975				975
Open Space[4]	75				2,172				40,680	162,720	40,680	46			0.19	76,343	305,374	76,343
Total		**5,883**	**150**	**3,509**				**197,333**	**40,680**	**162,720**	**238,013**	**267**		**235,310**		**76,343**	**305,374**	**311,653**

Notes:
1. Unit demand for landscape irrigation is based on 70 percent of effective ETO.
2. MDD for convention center is based on full occupancy of the facility. Average day demand for the convention center is based on the assumption that the convention facilities will be fully utilized 15 weeks out of the year (30 percent).
3. Unit demand factor for hotel room is used to calculate MDD for hotel rooms. Average annual hotel room demand is assuming average annual 80 percent occupancy.
4. 20 percent of outdoor irrigation demand supplied by City.
5. Peak day application rate is based on 70 percent of maximum month ETO, 8.3 in/month.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-14
Mace Triangle Site Buildout Demand

Land Use	Developer Provided Information		Customers	Unit Demand Factors		Average Annual Demand				Maximum Day Demand				
	Acres or square feet	Employees		gpd/ acre[1] or gpd/1,000 sq ft	gpd/ employee or customer (indoor)	Indoor Demand (gpd)	Outdoor Demand[2] (gpd)	Total Demand (gpd)	Total Demand - supplied by City (acft/yr)	Indoor Peaking Factor	Indoor MDD (gpd)	Peak day Application[3] (in/day)	Outdoor MDD[2] (gpd)	Total MDD (gpd)
Office		108			15	1,620		1,620	2	1.3	2,106			2,106
Retail		50			15	750		750	1	1.3	975			975
Retail (Business Water Use)			1,200		3	3,600		3,600	4	1.0	3,600			3,600
Landscaped Area (12 percent of total)[1]	2			2,712			5,288	5,288	6			0.19	10,061	10,061
Total		**158**	**1,200**			**5,970**	**5,288**	**11,258**	**13**		**6,681**		**10,061**	**16,742**

Notes:
1. Unit demand for landscape irrigation is based on 70 percent of effective ETO.
2. All outdoor irrigation demand is supplied by the City.
3. Peak day application rate is based on 70 percent of maximum month ETO, 8.3 in/month.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-15
Summary of Buildout Demands

	Annual (ac-ft/yr)	Maximum Day (mgd)
Existing City Service Area[1]	13,258	21.3
Proposed Developments[2]	1,066	1.3
Total[3]	**14,324**	**22.6**

Notes:
mgd = million gallons per day
ac-ft/yr = acre pet per year
1. Buildout demand for the City's existing service area, which is projected to occur with the assumed growth rate in 2023. Buildout demand projected to decline to 12,356 ac-ft/yr and 19.9 mgd by 2030.
2. Buildout demand for the proposed developments assumed to occur in 2025. Proposed developments are located outside of the City's current service area.
3. This total would occur if the buildout of the City's existing service area and the proposed developments occur in the same year. See Table 4.15-16 for the total demand with staggered buildout years.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

The City's historical and projected normal climate year water demands for the existing service area and the proposed developments are presented in Table 4.15-16. A normal climate year is defined to be a calendar year that has average or normal climate, and is typically quantified by precipitation and evapotranspiration. The total demand is projected to peak in approximately 2023 and then decline due to the drop in the per capita demand within the City's existing service area.

Table 4.15-17 presents the projected water demand by water use sector in five year intervals through 2035 for the entire water system, consisting of the existing service area and the proposed developments.

The projected demand for single-dry and multiple-dry years is provided in Table 4.15-18. During dry periods the hotter and drier conditions result in more outside water use. The impact on the City's water demands due to dry periods is estimated based on the weather normalization methodology developed by the CUWCC. The methodology uses monthly ETO and precipitation for any particular year compared to the average monthly climate values to determine the change in annual water use.

Table 4.15-16
Projected Average Year Demand -
Current Service Area and Proposed Developments (ac-ft/yr)

	2005	2010	2015	2020	2023	2025	2030	2035
Current Service Area	14,452	11,954	12,574	12,889	13,258	12,767	12,356	12,356
Proposed Development	-			533	852	1,066	1,066	1,066
Total	**14,452**			**13,421**	**14,110**	**13,833**	**13,421**	**13,421**

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-17
Projected Water Demands by Water Use Sector -
Current Service Area and Proposed Developments (ac-ft/yr)

Water Use Sector	Projected Water Demand					
	2015	2020	2023	2025	2030	2035
Single-family	6,332	6,420	6,611	6,374	6,169	6,169
Multi-family	2,659	2,766	3,158	2,782	2,695	2,695
Com/Inst/Ind	1,602	2,065	2,034	2,362	2,307	2,307
Landscape	346	496	575	655	644	644
Subtotal	**10,939**	**11,746**	**12,378**	**12,173**	**11,815**	**11,815**
System losses	1,635	1,745	1,834	1,798	1,745	1,745
Total	**12,574**	**12,421**	**14,110**	**13,833**	**13,421**	**13,421**

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-18
Projected Dry-Year Demand (ac-ft/yr)

	2015	2020	2025	2030	2035
Single-Dry Year[1]	13,328	14,226	14,663	14,226	14,226
Multiple-Dry Years[2]					
Year 1	12,888	13,757	14,179	13,757	13,757
Year 2	13,328	14,227	14,663	14,226	14,226
Year 3	12,951	13,824	14,248	13,824	13,824

Notes:
1. Single-dry year based on 2013 weather normalization.
2. Multiple dry year – Year 1 based on 2012, Year 2 based on 2013, and Year 3 based on 2014 weather normalization.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

To estimate the City's dry year demands using the normalization methodology, the single-dry year is assumed to be 2013 and the multiple-dry year period is assumed to be 2012, 2013, and 2014. The 2013 calendar year was one of the lowest years of precipitation on record in California. In 2014, due to the continuing drought, the SWRCB fully curtailed all post-1914 water rights diversions from the Sacramento River and its tributaries for several months. The actual monthly ETO and precipitation for these years used to determine that water demands in 2012, 2013, and 2014 were 2.5, 6.0, and 3.0 percent higher than the demand in a normal climate year, respectively. The adjustments are applied to the normal-year demand projections to estimate the dry year demands presented in Table 4.15-16 above.

Water Supply to Demand Comparison

The buildout annual and maximum day demands of the City's existing service area and the proposed developments are compared to the supply capacity in Table 4.15-19.

Table 4.15-20 compares the City's projected normal-year water demands to the supplies in five year intervals to 2035. The water demands represent the City's total water

demands and consist of the projected demands within the City's existing service area and the demands of the proposed project and other proposed developments.

Table 4.15-19
Normal-Year Buildout Demand to Supply Comparison

	Annual (ac-ft/yr)	Maximum Day (mgd)
Demand		
Existing City service area[1]	13,258	21.3
Proposed developments	1,066	1.3
Total[2]	**14,324**	**22.6**
Supply	15,253	23.4

Notes
1. Declining to 12,356 ac-ft/yr and 19.9 mgd as the City's service area per capita water use drops to 150 gpcd.
2. This total would occur if the buildout of the City's existing service area and the proposed developments occur in the same year. See Table 4.15-16 for the total demand with staggered buildout years.

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Table 4.15-20
Average-Year Water Demand and Supply Comparison (ac-ft/yr)

	2015	2020	2025	2030	2035
Demand within Current Services Area	12,574	12,889	12,767	12,356	12,356
Demand of Proposed Developments	-	533	1,066	1,066	1,066
Total Demand	**12,574**	**13,421**	**13,833**	**13,421**	**13,421**
Supply	12,574	15,253	15,253	15,253	15,253
Supply Minus Demand	-	1,831	1,419	1,831	1,831

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

As illustrated in Table 4.15-19 and Table 4.15-20, the capacities of the City's water supply facilities are sufficient to supply the City's normal-year buildout demand of the existing service area and the demands of the proposed project and other proposed developments over the 20-year planning horizon.

Table 4.15-21 provides a water supply and demand comparison for single- and multiple-dry years through the year 2035. As illustrated in Table 4.15-21, the City has the supplies to be able to meet dry year demands of the existing service area and the proposed project and other proposed developments over the 20-year planning horizon.

Water Supply Conclusion

According to the WSA prepared for the proposed project, sufficient water supplies are available to serve the proposed project and other proposed projects, as well as the buildout demands of the City's current service area over the next 20-years during normal-year, single-year, and multiple-dry year scenarios.

Table 4.15-21
Single- and Multiple-Dry Year Water Demand and Supply Comparison (ac-ft/yr)

	2015	2020	2025	2030	2035
Single-Dry Year					
Demand	13,328	14,227	14,663	14,226	14,226
Supply	13,328	15,253	15,253	15,253	15,253
Supply Minus Demand	-	1,026	590	1,026	1,026
Multiple-Dry Years					
Year 1					
Demand	12,888	13,757	14,179	13,757	13,757
Supply	12,888	15,253	15,253	15,253	15,253
Supply Minus Demand	-	1,496	1,074	1,496	1,496
Year 2					
Demand	13,328	14,227	14,663	14,227	14,227
Supply	13,328	15,253	15,253	15,253	15,253
Supply Minus Demand	-	1,026	590	1,026	1,026
Year 3					
Demand	12,951	13,824	14,248	13,824	13,824
Supply	12,951	15,253	15,253	15,253	15,253
Supply Minus Demand	-	1,428	1,005	1,429	1,429

Source: Brown and Caldwell. Water Supply Assessment. February 2015.

Water Delivery

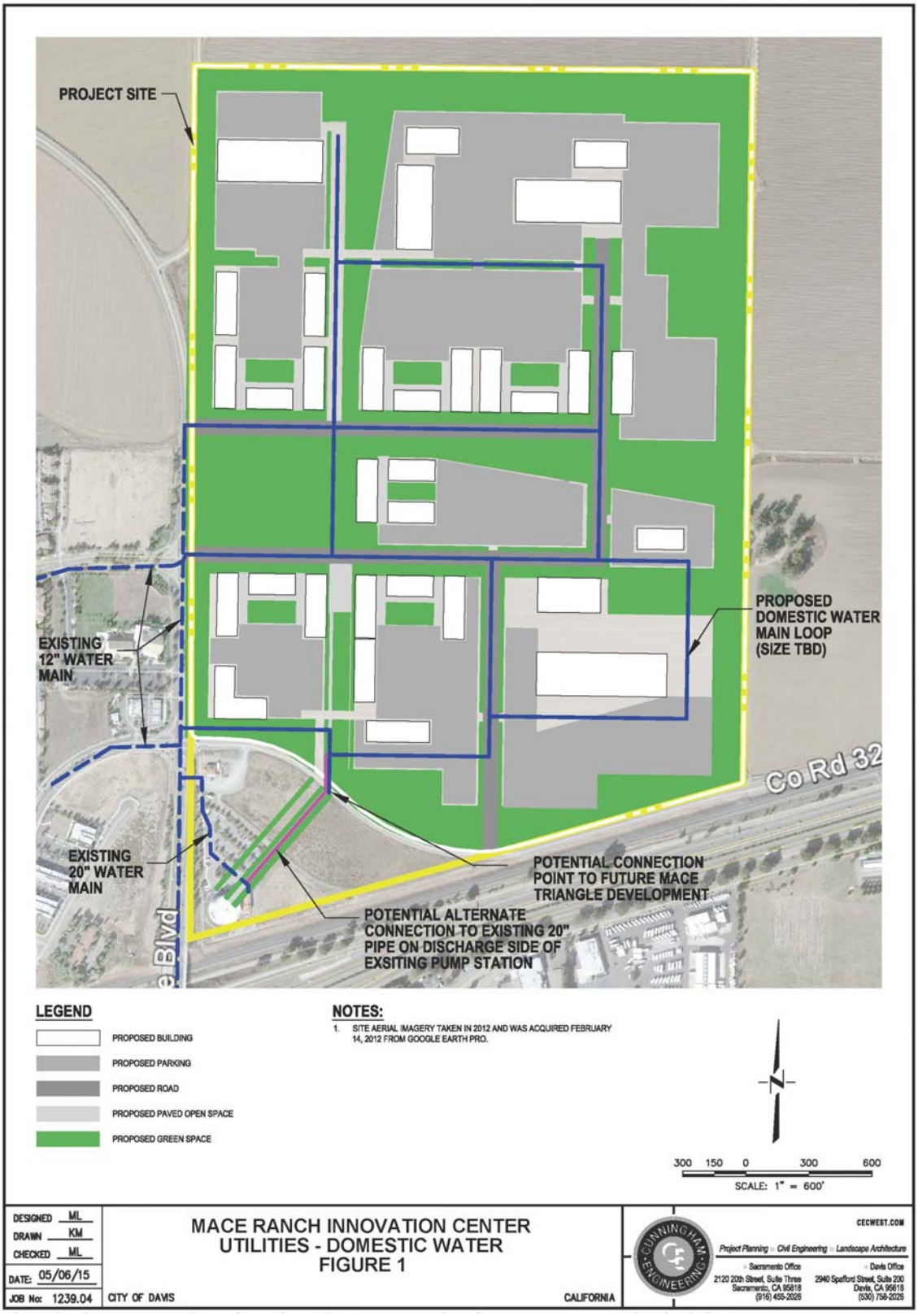
MRIC

Figure 4.15-7, identifies the proposed water infrastructure layout for the MRIC. Domestic water would be supplied by extending the existing 12-inch diameter City water main located along Mace Boulevard. The main would be looped throughout the MRIC to supply potable water to internal businesses. The loop will provide the site's interior-use service connections for the planned office/R&D/industrial uses, plus fire-fighting. It is expected that the improvements required to tie the proposed site loop to the City's existing water infrastructure at two or three locations on Mace Boulevard will be relatively minor, and can likely be coordinated with proposed surface improvements along the site's western frontage. Alternatively, the project may consider the option of making one of the loop connections to the existing 20-inch diameter main that connects to the booster pumping station at the 4 million gallon City water tank.

Mace Triangle

For preliminary planning purposes, future development of the Mace Triangle would include the installation of an internal domestic water system that could be supplied through a connection to the City's existing 20-inch water main on Mace Boulevard or through a connection to the existing 20-inch water line that connects to the booster pumping station at the City's water tank. Alternatively, as shown in Figure 4.15-7 above, the Mace Triangle could connect to the proposed MRIC looped water system, if said system is in place at such time the Mace Triangle develops.

Figure 4.15-7
Proposed MRIC On-Site Water Distribution System



The actual location for connection to the City's water system will be determined with final design of the Mace Triangle water system.

Hydraulic Modeling for Proposed Developments

Brown and Caldwell performed a hydraulic model analysis of the impacts on the City's existing water system from the proposed development projects, including: MRIC and the Mace Triangle, Davis IC, and the Nishi Project. The peak hour pressures and maximum velocities in the system were evaluated with the City's current service area at buildout and with the addition of the buildout demands for the proposed projects.

A maximum day demand of 22.6 mgd was assumed for buildout of MRIC and other development, consistent with the WSA prepared for the project. A fire flow of 4,000 gallons per minute was assumed as a worst-case for the fire flow model runs for the proposed project.

Peak Hour Pressure

Based upon the water demand assumptions listed above, Brown and Caldwell determined that the peak hour pressures over a 24-hour period would be maintained above 35 psi throughout the City's system, which meets the City's performance criteria.

Maximum Hardness

The maximum hardness in the City's system, with the addition of the future development demands, ranges from up to 110 mg/l in the west area of the system, to 100 mg/l in the east area of the system, and below 85 mg/l in the central north area of the system. These levels are consistent with the City's water quality goals set forth in its Water Distribution System Optimization Plan.

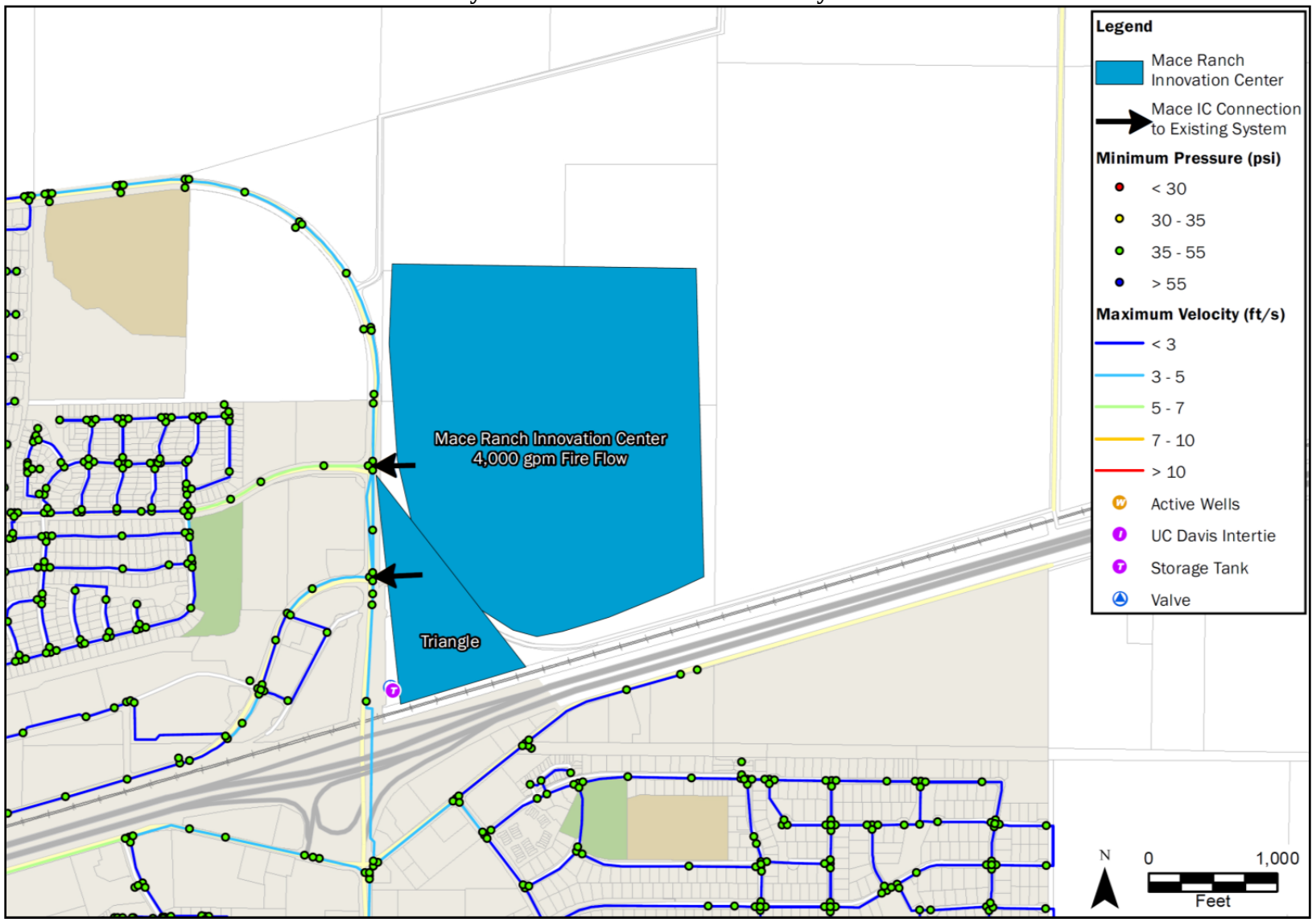
Maximum TDS

The maximum total dissolved solids (TDS) in the system, with the addition of the future development demands, ranges from 250 to 300 mg/l in the west and east area of the system, and 150 to 250 in the center of the system. These levels are also consistent with the City's water quality goals.

Pressures and Velocities during MRIC Fire Flow

The backbone water pipelines in the proposed project were added to the model (not shown on Figure 4.15-8 because the distribution system within the MRIC is not evaluated in this analysis) to better hydraulically simulate the fire flow demand impact on the existing system. The MRIC would connect to the existing distribution system at two locations as shown on Figure 4.15-8. Adverse pressure or velocity impacts as a result of this simulated fire flow within the MRIC were not observed.

Figure 4.15-8
City of Davis Water Distribution System



Water Delivery Conclusion

The City's existing water delivery infrastructure system would be able to accommodate the domestic and fire flow demands associated with the proposed project. Therefore, the proposed project would have a ***less-than-significant*** impact on water delivery.

Mitigation Measure(s)
None required.

4.15-3 Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments. Based on the analysis below and with implementation of mitigation, the impact is *less than significant.*

As discussed in the Methods of Analysis section, West Yost and Associates prepared two technical memorandums presenting assessments of the potential impacts of the proposed Proposed project upon the City of Davis' wastewater collection and treatment facilities.

Wastewater Treatment Plant Capacity

As mentioned above, West Yost evaluated impacts of the proposed project and other future projects on the WWTP are estimated, using the following three methodologies:

- Indoor Water Use Basis
- Land Use and Sewer Flow Factor Basis
- BOD Loading Basis

Indoor Water Use Basis

This option for estimating average wastewater flows from proposed development assumes that the generated wastewater is either equivalent or proportional to the projected indoor water use. For this analysis, it is assumed that indoor water use equates to the rate of wastewater generation. This assumption is generally valid where little or no indoor water is used for commercial or industrial process operations, and is thus considered applicable to the City.

The projected indoor water use associated with the proposed project (MRIC and Mace Triangle) is estimated in the WSA as 0.203 mgd. This result is below the estimated available WWTP ADWF capacity of 1.66 mgd, discussed above. However, the City has indicated that any available WWTP capacity is first committed to potential future growth within the existing City limits, as planned in the City's General Plan. The indoor water use associated with future General Plan buildout development is estimated in the WSA, which presents total projected water use on an annual average basis, and then assumes that indoor water use represents 49 percent of residential use and 46 percent of

commercial / industrial / institutional uses. Assuming that indoor water use equates with wastewater generation, the predicted wastewater flows from future General Plan buildout development are summarized in Table 4.15-22.

Table 4.15-22
Estimated Wastewater Generation from General Plan Buildout Development

Source	Water Demand (ac-ft/yr)	Indoor Use Percentage	Wastewater Generation (mgd)
Residential, Single-family	315	49	0.28
Residential, Multiple-family	276	49	0.25
Commercial/Industrial/Institutional	213	46	0.19
Total	**804**	**-**	**0.72**

Notes:
ac-ft/yr = acre feet per year
mpd = million gallons per day

Source: West Yost Associates. Impacts of Innovation Center/Nishi Property Development on Wastewater Treatment Plant Capacity. Technical Memorandum (Final). April 2, 2015.

Combining the results from Table 4.15-22 with the proposed project's wastewater generation of 0.203 mgd results in a total wastewater generation from future General Plan buildout and the proposed project of 0.923 mgd. However, given the uncertainties associated with future development, a 20 percent factor of safety is applied, which produces a total estimated wastewater generation from future General Plan buildout and the proposed project of 1.11 mgd. This result is below the estimated available WWTP ADWF capacity of 1.66 mgd, once the current upgrade project is completed in Fall 2017. Thus, it can be concluded that the WWTP can accommodate wastewater flows from future General Plan buildout and the proposed project, according to this flow estimation method.

Land Use and Sewer Flow Factor Basis

Another approach used to estimate wastewater generation involves coupling future land use estimates with associated sewer flow factors. As illustrated in Table 4.15-12 above, the SSMP specifies sewer flow factors for a range of land uses.

Again, given the City's commitment to reserve available WWTP capacity for future General Plan buildout, it is necessary to determine the amount of wastewater generation associated with future buildout of land uses, consistent with the City's General Plan. While the WSA does not specify the number of future single-family versus multiple-family units to be added to the City service area, it does specify the total number of residential units to be added (2,231), and it also specifies the number of future water supply connections to be added. Specifically, 815 future additional single-family water supply connections are indicated. If it is assumed that a one-to-one correspondence exists between single-family units and single-family connections, then a total of 1,416 future additional multiple-family units can be inferred. The WSA also specifies 7,500 future employees to be added, although it does not make any assumptions about future retail

customers associated with future commercial development. For this analysis, flows associated with future retail customers are considered to be non-significant. Given these assumptions, the ADWF associated with General Plan buildout development is shown in Table 4.15-23.

Table 4.15-23
Projected Wastewater Generation from General Plan Buildout Development

Category	Flow Factor (gpd/unit)	Quantity	Average Flow (mgd)
Residential, Single-family	330	815	0.27
Residential, Multiple-family	230	1,416	0.33
Employees	15	7,500	0.11
Total	**-**	**-**	**0.71**

Source: West Yost Associates. Impacts of Innovation Center/Nishi Property Development on Wastewater Treatment Plant Capacity. Technical Memorandum (Final). April 2, 2015.

The same method can be used to estimate future wastewater flows associated with the proposed project specified above. The City SSMP does not specify sewer flow factors for either retail customers or convention center guests, both of which are applicable for the proposed project. However, the WSA specifies indoor water use factors of three gpd per customer/guest for both. That value, used in combination with sewer flow factors in Table 4.15-12, and the proposed project land use quantities, results in an estimate of 0.111 mgd average flow for the proposed project.

Combining this result with the results from Table 4.15-23 produces a total estimated wastewater generation from future development of 0.821 mgd. However, given the uncertainties associated with future development, West Yost applied a 20 percent factor of safety, which produces a total estimated wastewater generation from future General Plan buildout and the proposed project of development of 0.985 mgd. Given the estimated available WWTP ADWF capacity of 1.66 mgd discussed above, it can be concluded that the WWTP can accommodate all future development, including the proposed project, according to this flow estimation method.

BOD Loading Basis

A third way to assess the impacts of future development on the WWTP involves considering future BOD loadings entering the WWTP. At present, data are not available that distinguish between the BOD content of residential versus commercial/institutional sources within the City. However, for a non-industrial community such as Davis, commercial/institutional wastewater tends to be very similar to residential wastewater in character, such that the two may be considered roughly equivalent.

As noted above, the existing WWTP influent average dry weather BOD loading is estimated to be 8,300 lbs/day (including a 5 percent safety factor). The WSA indicates that 86 percent of existing indoor water use is attributable to residential development, while 14 percent is attributable to non-residential development. Assuming again that

indoor water use equates with wastewater generation, and assuming that residential and non-residential wastewater are of equivalent strength (i.e., BOD concentration), then 7,100 lbs/day of dry weather BOD loading is coming from residential sources.

The WSA shows a total of 26,596 existing DUs as of 2013. Dividing the existing residential dry weather BOD load of 7,100 lbs/day by the number of existing DUs produces a residential unit BOD loading factor of 0.267 lbs/day per DU. For this analysis, West Yost assumed that this unit load applies to all future residential dwelling units also. It should be noted that due to higher vacancy rates in the summer months, this unit BOD loading factor is lower than what would occur at other times of year. However, the WWTP design includes an allowance for higher loads during the school year, and all such allowances are preserved in this analysis.

Future non-residential development is more difficult to estimate a unit BOD loading factor because there is not a clear non-residential "unit" to which such a calculation could be applied. Therefore, for this analysis, future non-residential BOD loads are estimated by applying the existing average influent BOD concentration (219 milligrams per liter [mg/L], from Table 4.15-11 above) by the indoor water use rates indicated in the WSA.

For future General Plan buildout development, the estimated BOD loading is projected to be 1,140 lbs/day, with a 20 percent safety factor (see Table 4.15-24).

Table 4.15-24
Projected Future BOD Loads for General Plan Buildout Development

Category	Projected BOD Load (lbs/day)	Plus 20 Percent Safety Factor (lbs/day)
Residential	600	720
Non-Residential	350	420
Total	**950**	**1,140**

Source: West Yost Associates. Impacts of Innovation Center/Nishi Property Development on Wastewater Treatment Plant Capacity. Technical Memorandum (Final). April 2, 2015.

As indicated in Table 4.15-25 below, after accounting for future General Plan buildout, the WWTP would have an estimated available BOD loading capacity of 660 lbs/day. West Yost has calculated the proposed project's BOD loading to be 370 lbs/day, and 440 lbs/day with a safety factor of 20 percent. Therefore, after accounting for future General Plan buildout, the WWTP would have sufficient capacity to fully accommodate the BOD loading projected for the proposed project, assuming a safety factor of 20 percent.

Table 4.15-25
Summary of Existing and Future Capacity and Flow/Loading Conditions

Condition	Average Dry Weather Flow (mgd)	Average Dry Weather BOD Load (lbs/day)
WWTP Capacity	6.0	10,100
Existing Conditions	4.34	8,300[1]
General Plan Buildout	5.05[2]	9,440[3]
Remaining Capacity	0.95	660
Proposed Development Project Contributions		
Davis IC	0.19[4]	710[5]
MRIC Site/Mace Triangle Site	0.11[4]	440[5]
Nishi Property	0.18[4]	300[5]

Notes:
1. Includes a five percent safety factor.
2. Based on City sewer flow factors and projected buildout land uses (see Table 4.15-23).
3. Includes a 20 percent safety factor.
4. Based on City sewer flow factors and projected buildout land uses (see Table 4.15-24).
5. Includes a 20 percent safety factor.

Source: West Yost Associates. Impacts of Innovation Center/Nishi Property Development on Wastewater Treatment Plant Capacity. Technical Memorandum (Final). April 2, 2015.

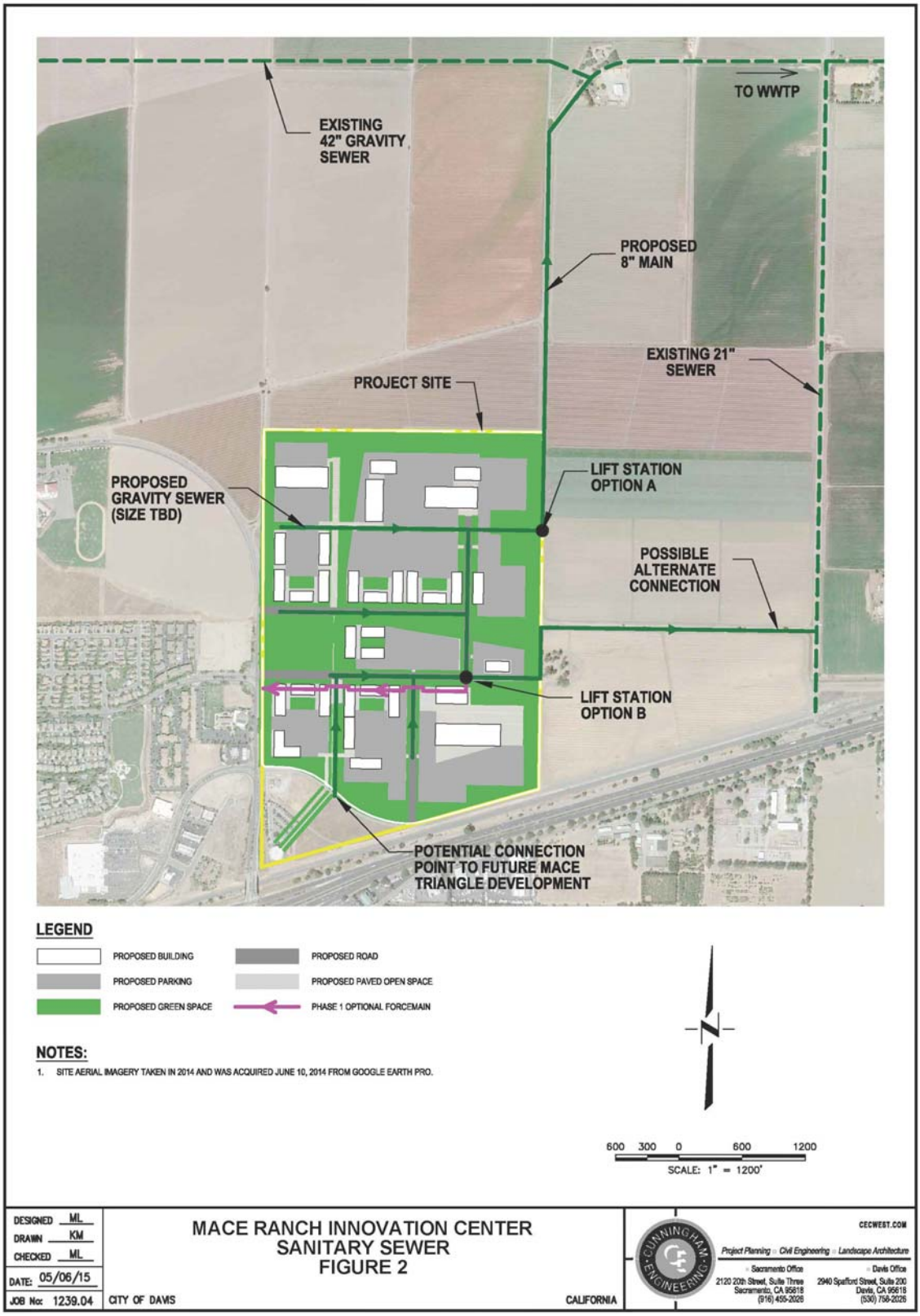
Wastewater Collection

Proposed Improvements

The project includes installation of a gravity sewer pipe within the internal road rights-of-way. This gravity sewer line would collect wastewater generated on-site, and route said wastewater to the northeastern corner of the MRIC. From this corner, the project includes installation of an off-site wastewater delivery pipe, the alignment of which would run north of the project site, approximately 0.7-mile, where the pipe would connect to an existing manhole along CR 30, near an existing rural residence (see Figure 4.15-9). Wastewater from the project would then flow east through an existing 42-inch gravity sewer line, along CR 30, to the intersection of CR 30/CR 105, where the pipe extends north along CR 105 to the City's Wastewater Treatment Plant (WWTP).

An alternative off-site sewer alignment has also been identified for the MRIC, and is therefore evaluated in this EIR. As shown in Figure 4.15-9, this alternative sewer alignment would extend east from the site, along the Mace Channel, and would connect to the existing 21-inch sewer pipe in CR 105, from which point the project's wastewater would flow north to the City's WWTP.

Figure 4.15-9
MRIC Wastewater Collection System



According to the MRIC Sewer Analysis, prepared by Cunningham Engineering, using an all gravity collection and conveyance system, with 8-inch mains throughout the MRIC site, is infeasible. As such, it is likely that a sewer lift station would be incorporated at some location on-site. The lift station would discharge to either a gravity or force main outfall.[21]

The lift station would likely be located at one of the locations shown in Figure 4.15-9, which would be influenced by the point of connection chosen for the project site. Option A is located near the northeast corner and may be considered if the on-site flows ultimately connect to the existing 42-inch main north of the project site. Option B is near the southeast side of the property and would be considered if the site sewer were to connect to the existing 21-inch pipe east of the project site.

Estimated wastewater flow generation numbers from the proposed project are shown in Table 4.15-26 for both a sewer flow factor basis and an indoor water use basis. These two approaches result in a PWWF from the project of 0.427 mgd and 0.637 mgd, respectively.

Table 4.15-26
Projected Wastewater Flows from the MRIC and the Mace Triangle Site

Category	Sewer Flow Factor Basis	Indoor Water Use Basis
ADWF (mgd)	0.111	0.203
PDWF (mgd)	0.290	0.500
I&I (mgd)[1]	0.137	0.137
PWWF (mgd)	0.427	0.637

Notes:
[1] Based on an assumed gross area of 228 acres.

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

Collection System Capacity Analysis

According to the City Sewer Spreadsheets, the 42-inch diameter trunk sewer, north of the project site, is predicted to flow at 88 percent of capacity at buildout PWWF conditions. Similarly, the 21-inch diameter trunk sewer serving south Davis is predicted to flow at 84 percent of capacity at buildout PWWF conditions. In light of the City's d/D standard of 0.75 specified in the 2009 SECAP, the remaining available capacity in these lines would be 0.31 mgd in the 42-inch diameter trunk sewer, and 0.28 mgd in the 21-inch diameter trunk sewer.

Taken at face value, there appears to be inadequate capacity available in either trunk sewer to accommodate the proposed development. It should be noted, however, that the

[21] Cunningham Engineering Corporation. *Mace Ranch Innovation Center – Preliminary Sewer Infrastructure Study*. December 12, 2014.

City's flow factors appear to significantly overestimate flows from at least some types of development.[22] One way to assess the accuracy of the City's flow factors is to consider current land use totals and flow rates City-wide. Existing land use quantities (as taken from the WSA) and associated ADWF estimates, based on the use of the City's sewer flow factors, are shown in Table 4.15-27.

Table 4.15-27
Estimated Wastewater Generation from Existing Development City-Wide

Source	Units	Quantity	Flow Factor (gpd/unit)	ADWF (mgd)
Residential, Single-family	Dwelling Units	14,516	330	4.79
Residential Multi-family	Dwelling Units	12,080	230	2.78
Commercial/Institutional	Employees	37,500	15	0.56
Total	**-**	**-**	**-**	**8.13**

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

The current ADWF to the WWTP was calculated to be 4.34 mgd.[23] The results in Table 4.15-29 show that using the City's flow factors from the SSMP, the calculated ADWF is nearly double the current ADWF at the WWTP. Moreover, the flow from the single-family residential category alone is calculated to generate more average flow than the current ADWF at the WWTP. West Yost thus concludes that the use of the City's current flow factors significantly overestimates the actual ADWF.

With regard to the calculation of PDWF, the peaking factors calculation discussed above appears reasonable, and produces dry weather peaking factors that are generally consistent with similar peaking factor assumptions used by other agencies. Given that the PDWF calculation is based on what appears to be an overestimated ADWF, it is likely the resultant PDWF estimates are also unrealistically high.

According to West Yost, the findings in Table 4.15-29 suggest that a 46 percent reduction in the City's collection system ADWF estimates is justified. If the ADWF estimates in the City Sewer Spreadsheets are reduced by 40 percent, then the 42-inch diameter trunk sewer would have approximately 5.0 mgd of allowable capacity remaining at General

[22] For example, West Yost, in their Technical Memo entitled "Impacts of Innovation Center/Nishi Property Development on Wastewater Collection System Capacity," observed that City Sewer Spreadsheets predict a buildout ADWF in the 36-inch diameter portion of the Covell trunk sewer that is approximately as high as the current ADWF at the Davis WWTP, and more than two thirds of the design ADWF for that facility. By comparison, the tributary area in question represents about half of the total development within the City. Moreover, the planned future development in areas tributary to the Covell trunk sewer represents only a small portion of the total buildout development. In other words, the vast majority of development in those areas has already occurred, such that future development (apart from the Davis IC) is minor in those same areas. It therefore appears that the City's flow factors significantly overestimate flows from at least some types of development.

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

Plan buildout PWWF conditions, while the 21-inch diameter sewer would have approximately 1.4 mgd of allowable capacity remaining at General Plan buildout PWWF conditions. Therefore, adequate buildout PWWF capacity would exist in both lines to handle the additional flow generated by the proposed project.

MRIC Phase 1 Improvements

Cunningham Engineering believes that while the existing 8-inch sewer line in Mace Boulevard does not have capacity to convey wastewater flows generated by the proposed project at buildout, it is possible that this existing line may be able to service MRIC Phase I of the proposed project in an interim condition. This is based on the factor that several contributing neighboring land uses have not been developed at the densities originally intended in the City's sewer master plan.

MRIC Phase 1 is anticipated to consist of approximately 48 acres in the southern portion of the MRIC site. MRIC Phase 1 is estimated to contain approximately 540,000 square feet, which will include 400,000 square feet of Research/Manufacturing space to accommodate the expansion needs of Schilling Robotics, and 140,000 square feet of research/office/R&D, which may incorporate ground floor ancillary retail of up to 40,000 square feet.

A sewer study would be required to determine what, if any, capacity remains in the existing Mace Boulevard line. Assuming there is surplus capacity in the Mace Boulevard line, the MRIC Phase I flows may be pumped via a lift station and force-main in the interim condition to Mace Boulevard, as shown in Figure 4.15-9. At buildout, upon completion of the off-site sewer connection, this flow may be redirected with the remainder of the site sewer.

Mace Triangle

The nearest existing City sewer main to the Mace Triangle is an 8-inch line, located in Mace Boulevard. If the Triangle develops ahead of the MRIC, then the future developer could possibly connect to the existing 8-inch line within Mace Boulevard. Based upon the MRIC Phase 1 discussion above, this 8-inch line would have sufficient capacity to collect the wastewater generated by the maximum development potential of the Triangle, which is 71,056 sf of non-residential uses. If the MRIC develops its sewer infrastructure ahead of the Mace Triangle, then the Mace Triangle development can connect to the innovation center's sewer system, as conceptually shown in Figure 4.15-9. If the Mace Triangle interconnects with the MRIC's system, then the Mace Triangle's wastewater would ultimately flow to the City's existing 42-inch trunk main, located just over a half-mile north of the MRIC, or to the existing 21-inch main in County Road 105, depending upon which off-site sewer alignment is selected for the MRIC.

Conclusion

Based upon all three methods of estimating average wastewater flows from the proposed development (indoor water use; land use and sewer flow factor basis, and BOD loading), the City's WWTP, after accounting for reserve capacity for remaining General Plan buildout, is projected to have adequate capacity to accommodate full buildout of the MRIC and Triangle Site. As a result, the proposed project would have a less-than-significant impact related to resulting in the City's WWTP having inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

Using the City's design standards and flow calculations, the 42-inch and the 21-inch diameter trunk mains appear to lack the capacity to accommodate future General Plan growth and the proposed project. However, upon downward-adjusting the ADWF values in the City Sewer Spreadsheets by 40 percent (as appears justified from this analysis), there appears to be adequate PWWF capacity in both trunk mains for future City General Plan buildout development plus the flow from the proposed project, assuming that actual project flows conform relatively closely to those assumed in this analysis. It cannot be guaranteed, however, that available trunk system capacity would be sufficient if actual wastewater flow generation rates for the proposed project are significantly higher than currently assumed. In addition, should the applicant pursue a connection to the 8-inch Mace Boulevard sewer line for MRIC Phase 1, a potential impact could result to the pipe's ability to adequately convey sewer flows.

As a result, with implementation of the following mitigation measures, the proposed project could result in a ***less-than-significant*** impact related to the City's wastewater collection system.

Mitigation Measure(s)

MRIC

4.15-3(a) *The applicant shall provide for annual wet-weather monitoring of the existing off-site 42-inch or 21-inch sanitary sewer line, depending upon which off-site sewer alignment is chosen for the project, over the course of project buildout to confirm that there is capacity within the line to serve the MRIC, in combination with existing and future projected General Plan buildout. If the wet weather monitoring fails to confirm capacity within the chosen existing sanitary sewer line, the applicant shall either upsize the existing sewer line, subject to reimbursement, or install a parallel line, subject to review and approval by the City Engineer.*

4.15-3(b) *If the applicant pursues a connection to the existing 8-inch sewer line in Mace Boulevard to serve Phase 1 of the MRIC Project, then prior to approval of Improvement Plans for Phase 1, the applicant shall prepare and submit to the Davis Public Works Department, a sewer study, which shall determine the available capacity in the 8-inch sewer pipe in Mace*

Boulevard. If the 8-inch line has adequate capacity for Phase 1 of the MRIC, then no further mitigation is needed. If the sewer study determines that the 8-inch line does not have adequate capacity to serve Phase 1, then the applicant shall upsize the sewer pipe within Mace Boulevard, or pursue construction of the northerly or easterly off-site sewer pipe connection alternative. The design of the sewer pipe improvements shall be reviewed and approved by the City Engineer prior to approval of Phase 1 Improvement Plans.

Mace Triangle – none

4.15-4 Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs or fail to comply with federal, State, and local statutes and regulations related to solid waste. Based on the analysis below, the impact is *less than significant*.

The potential impacts associated with solid waste are discussed for the MRIC and the Mace Triangle separately below.

MRIC

Mixed Solid Waste

Solid waste services (collection and recycling) are provided to the City of Davis by Davis Waste Removal, a private firm under contract with the City. All non-recyclable wastes collected from the City are disposed of at the 770-acre Yolo County Central Landfill in the northeast portion of the Davis Planning Area. The City does not contain any special landfill sites. According to the *Davis Integrated Waste Management Plan*, the Yolo County Central Landfill is not operating at capacity and has a current anticipated closure date of 2081.[24]

The MRIC is expected to generate accommodate 5,882 employees within the City of Davis. Approximately 200 employees could be accommodated for the proposed retail land uses, while another 50 employees could be accommodated for the proposed hotel land use. In addition, an anticipated 5,632 employees would be accommodated by the approximately 2,394,000 sf of innovation center uses (including research, office, R&D tech office, lab manufacturing, research, assembly, and flex) would be generated by the proposed project. Using the Cal EPA Integrated Waste Management Board annual disposal rate for large hotels, the proposed hotel use could generate approximately 97.5 tons of waste per year.[25] In addition, using the Cal EPA Integrated Waste Management Board annual disposal rate for retail and other stores, the proposed retail use could

[24] City of Davis. *Davis Integrated Waste Management Plan*. July 2013.
[25] California Environmental Protection Agency, Integrated Waste Management Board. *Waste Disposal and Diversion Findings for Selected Industry Groups*. Table 21, Page 88. June 2006.

generate approximately 172 tons of waste per year. Furthermore, using the Cal EPA Integrated Waste Management Board annual disposal rate for large office buildings, the proposed office use could generate approximately 2,238.4 tons of waste per year. Overall, the MRIC could generate approximately 2,508 tons of waste per year.

An additional 3,775.9 tons of waste per year would constitute only 0.031 percent of the remaining capacity at the Yolo County Central Landfill of approximately 36,555,700 cubic yards.[26] In addition, 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.

Hazardous Waste

The Project Description identifies proposed land uses, but the specific businesses or activities that could operate in the MRIC are not known at this time. It is anticipated that some businesses would involve the routine use of hazardous materials at varying levels that would require disposal. Quantification of precise amounts of additional hazardous materials use associated with new proposed uses is not practical at this stage of project review.

Hazardous wastes are considered to include waste that is toxic, reactive, ignitable, or corrosive. The uses at the MRIC site would consist of research/office/R&D and manufacturing uses. Some of the uses allowed may include high-tech business, such as agricultural research, bio-technology, green technology, and robotics.

Businesses that can be considered a Conditionally Exempt Small Quantity Generator (CESQG), per the below monthly waste generation criteria, can take their hazardous waste to the Yolo County Central Landfill for disposal.

- Less than 220 pounds or 27 gallons of most hazardous materials (i.e. paints, solvents, chemicals).
- Less than 2.2 pounds of acutely hazardous chemicals, (i.e., mercury or some lab chemicals).
- Less than 110 pounds of perchloroethylene.

If a proposed business would not qualify as a CESQG, then the hazardous waste would need to be disposed of at a Treatment, Storage, and Disposal Facility (TSDF) via a

[26] [(2,508 tons/yr) / (0.218 tons/cubic yard)] = 11,505 cubic yards. Conversion rates from http://www.calrecycle.ca.gov/FacIT/Conversion1.pdf; accessed April 1, 2015.

hazardous waste transporter, approved by the California Department of Toxic Substances Control. There are various DTSC-approved transporters within the region.

Mace Triangle

While development of the 16.58-acre Mace Triangle site is not proposed at this time, this EIR evaluates the future development potential based upon the proposed General Plan designations for the Mace Triangle. Future potential buildout of the Mace Triangle could result in approximately up to 45,901 square feet of research/office/R&D, and 25,155 square feet of ancillary retail. According to the BAE estimates, future development of the Mace Triangle could generate up to 158 additional employees. Using the Cal EPA Integrated Waste Management Board annual disposal rate for large office buildings, the Mace Triangle could generate approximately 66.4 tons of waste per year, which can be easily accommodated within the Yolo County Central Landfill's capacity, as discussed above. If any future uses would involve the routine use of hazardous materials, these materials would be disposed of at the Yolo County Central Landfill under the CESQG provisions, unless otherwise warranted, as discussed above for the MRIC.

Conclusion

The Yolo County Central Landfill has sufficient capacity to accommodate the proposed project's solid waste, which would constitute only a fraction of the landfill's remaining capacity. In addition, any hazardous waste generated at the MRIC would be disposed of at the Yolo County Central Landfill under the CESQG provisions, unless a proposed business would exceed the allowable limits for a CESQG, in which case the business' hazardous waste would be disposed of at an approved TSDF via a DTSC-approved Transporter. Therefore, the proposed project would have a ***less-than-significant*** impact with respect to being served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.

Mitigation Measure(s)
None required.

4.15-5 Gas and electric facilities. Based on the analysis below, the impact is *less than significant.*

Development of the proposed project would increase demand for electricity and natural gas services in order to serve the 2,654,000 square foot MRIC and the potential future development associated with the 16.58-acre Mace Triangle. As discussed in the Greenhouse Gas Emissions and Energy section of this EIR, according to CalEEMod, at full buildout, the project could be expected to result in an electricity demand of 24.03 gigawatt-hours (GWh) per year, which would be a maximum of 0.02 percent of PG&E's total planning area projected electricity consumption in 2024. In addition, according to the CalEEMod results for the proposed project, at full buildout, the project could be expected to result in consumption of natural gas of approximately 0.27 therms per year,

which would be a minor fraction of the amount (approximately $5.8x10^{-9}$ percent) of PG&E's total planning area projected consumption in 2024.

According to PG&E, the load demand created by the proposed MRIC, would be able to be accommodated by existing substations in the area.[27] In addition, according to utility maps provided by PG&E, existing gas and electric infrastructure is located within the roadways surrounding the project site. The applicant for the MRIC site, and any future applicants associated with buildout at the Mace Triangle, would be responsible for funding the construction of the on-site gas and electric infrastructure needed to connect to existing, adjacent infrastructure. The design-level details for each phase of development would be worked out in consultation with PG&E, prior to confirmation of service.

In summary, because PG&E has confirmed that its existing substations could serve the proposed project, and the project applicant will be responsible for funding the installation of the necessary gas and electric infrastructure, in coordination with PG&E's planning staff, the proposed project would have a ***less-than-significant*** impact to gas and electric facilities.

Mitigation Measure(s)
None required.

4.15-6 Adequate telecommunications facilities. Based on the analysis below and with implementation of mitigation, the impact is *less than significant.*

MRIC

Telecommunications providers are on-demand services, generally expanding their systems in response to demand, and would be anticipated to provide extensions of existing infrastructure to the project site as required. The service providers would provide any needed upgrades to their distribution systems, including new switching and routing equipment, to accommodate the demand of the project. Such extensions would require minimal trenching, if any, and would not be anticipated to result in significant environmental impacts.

Specific consideration is given here to broadband due to the data processing needs that can be expected by future innovation center tenants. Broadband consists of either fiber optic, copper wire, or wireless systems. Among these options, fiber-optic has the greatest bandwidth potential, and is routinely installed during construction of new developments. The City of Davis includes at least four fiber routes that currently follow the UPRR tracks. One of these fiber routes extends to the north and follows Pole Line Road, and another fiber route follows Mace Boulevard, south of UPRR tracks and I-80. Connection points to these major fiber routes exist within the City of Davis, and are situated within

[27] Personal email communication between Nick Pappani, Vice President, Raney Planning & Management, Inc. and Seth Perez, Land Agent, PG&E. March 23, 2015.

communications vaults and equipment cabinets. The project could extend fiber optic line to existing intercity connection points in order to bring broadband service to the MRIC site.

Similar to other fiber optic installations, it is anticipated that extension of fiber optic to existing intercity connection points would be accomplished by placing the fiber within existing utility trenches. As such, it is expected that fiber installation would be exempt from CEQA, most likely under CEQA Guidelines Section 15301 – Existing Facilities, or CEQA Guidelines Section 15303 – New Construction or Conversion of Small Structures.

Prior to constructing each phase of the MRIC, the applicant would coordinate with the service providers to identify points of connection to existing telecommunications lines and any needed upgrades to the existing system, which would be designed to occur within existing development areas. Due to the need for broadband service to the project site, implementation of the following mitigation measure would ensure that the MRIC would have a less-than-significant impact to telecommunications facilities.

Mace Triangle

The Mace Triangle parcels have been included as a part of the MRIC application at the City's direction primarily for the purposes of annexation. The undeveloped portion of the triangle parcels is proposed for development but not as a part of the MRIC. As a part of the application, the City has prepared a proposed Preliminary Planned Development (PPD) Ordinance that would apply only to the three Triangle parcels. The PPD would allow the following:

- The City property would be designated Public-Semi-Public to allow for the continuation of existing uses. No new uses are proposed.

- The Ikeda parcel and other agricultural parcel would be designated General Commercial to allow for the continuation or expansion of the existing agricultural retail (Ikeda's market) and/or for the development of up to 71,056 sf of new commercial uses.

Regarding the latter, the purpose of the General Commercial subarea is to allow the existing agricultural retail use to expand and prosper, and to allow for other commercial uses. As compared to the MRIC site, where the site is being planned for businesses often using large amounts of data, the Mace Triangle is anticipated to contain commercial-retail businesses; and as such, broadband would not be expected to be an integral component to the successful operation of these businesses.

Other telecommunications services for the Mace Triangle, such as phone and cable, would be considered on-demand, whereby telecommunications providers would generally expand their systems in response to demand, and would be anticipated to provide extensions of existing infrastructure to the project site, as required.

Conclusion

Given the importance of broadband for the innovation center planned for the MRIC, the following mitigation measure, requiring installation of dark fiber and intercity connections to existing fiber routes, would ensure that the MRIC would have a ***less-than-significant*** impact to telecommunications facilities. The Mace Triangle would have a less-than-significant impact to telecommunications facilities.

Mitigation Measure(s)

MRIC

4.15-5 *Prior to approval of construction drawings for each phase of the project, the drawings shall include "dark" fiber routes within the MRIC site and connection points to the existing intercity fiber routes, subject to review and approval by the City Engineer.*

Mace Triangle – none.

4.15-7 Conflict, or create an inconsistency, with any applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigation environmental effects related to utilities. Based on the analysis below, the impact is *less than significant*.

Table 4.15-28 lists the applicable City of Davis General Plan policies and Municipal Code Ordinances related to utilities and includes a discussion of the proposed project's compliance with the policies. As demonstrated in the table, the project design is generally consistent with the relevant policies of the City of Davis General Plan and the relevant ordinances of the Davis Municipal Code. Accordingly, the proposed project would not conflict, or create an inconsistency, with any applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigation environmental effects related to utilities, and impacts would be ***less than significant***.

Mitigation Measure(s)
None required.

Table 4.15-28
Utilities Policy Discussion

Plan, Policy, or Regulation			Project Consistency
Chapter 6, Water of the Davis General Plan			
Policy WATER 1.1	Give priority to demand reduction and conservation over additional water resource development.		Surface water and deep aquifer groundwater combined with water conservation comprise the majority of the proposed project's water supply. This analysis assumes that the City would utilize the wholesale surface water supply and the deep aquifer groundwater. Water conservation would continue to be implemented to reduce the City's existing service area per capita water use from the 20x2020 target of 167 gpcd to achieve 150 gpcd by 2030.
	Standard 1.1.a	Water-conserving plumbing is required in all new residential construction as required per state legislation.	
	Standard 1.1.b	Implement a water meter-based billing system.	
	Standard 1.1.c	Water usage meter rates shall include economic disincentives for excessive usage, without penalties for average water users.	
Policy WATER 1.2	Require water conserving landscaping.		See Article 40.42 WATER EFFICIENT LANDSCAPING consistency discussion below.
	Standard 1.2.a.	City projects shall include water-conserving landscaping and irrigation practices.	
	Standard 1.2.b	Developers and builders shall install water-conserving landscaping and irrigation systems in accordance with the City's water conservation in landscaping requirements. Provide homeowners information on water conserving landscaping and irrigation systems, if not provided in construction.	

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Utilities Policy Discussion

Plan, Policy, or Regulation		Project Consistency
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.	According to the WSA prepared for the proposed project and Impact 4.15-1 discussion of this section, adequate water supply would exist for the development and buildout of the proposed project.
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.	According to the Technical Memorandums prepared by West Yost and Impact 4.15-2 discussion of this section, adequate wastewater collection and treatment capacity would exist for the proposed project, after accounting for future General Plan buildout.
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.	See Policy WATER 5.1 discussion.
Chapter 7, Materials, Solid Waste and Recycling Chapter of the Davis General Plan		
Policy MAT 1.1	Promote reduced consumption of non-renewable resources. Standard 1.1.a Coordinate with Yolo County Central Landfill to encourage the reuse of materials deposited at the landfill. Standard 1.1.b Encourage reuse of refillable bottles.	<u>MRIC</u> Buildings constructed as part of the MRIC would conform to the California Green Building Code/Tier One requirements as per City of Davis requirements. The Building Performance guidelines identify six distinct categories of sustainable design that are appropriate for the unique requirements of the buildings, which includes Resources Recycling and Waste, among others. In addition, the MRIC would maximize to the extent feasible the use of recycled construction materials and materials with recycled content, as required per current codes and City Standards. Strategies include: • Maximize to the extent feasible the use of rapidly renewable materials, as required per current codes and City Standards. • Use to the extent feasible local materials for building construction by taking advantage of local construction techniques, as required per current codes and City Standards. • Minimize to the extent feasible construction waste and recycle waste material, as required per current codes and City Standards. Consider the storage and collection of recyclables during and after building construction.

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Utilities Policy Discussion

Plan, Policy, or Regulation			Project Consistency
			Mace Triangle Any future development associated with the Mace Triangle would be required to comply with Chapter 32 of the City's Municipal Code, which 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.
Policy MAT 2.1	Plan for the long-term waste disposal needs of Davis.		As described above in the Impact 4.15-3 discussion, solid waste generated by the MRIC buildout and possible Mace Triangle buildout would not exceed the 770-acre Yolo County Central Landfill's remaining capacity.
Chapter 8, Computers and Telecommunications Chapter of the Davis General Plan			
Policy C&T 1.1	Implement a program of technology, planning, installation and education.		Refer to Impact 4.15-5
	Standard 1.1.a	New residential and commercial development projects should include the infrastructure components necessary to support modern communication technologies such as conduit space within joint utility trenches for future high speed data equipment and flexible telephone conduit to allow for easy retrofit for high speed data systems.	
	Standard 1.1.b	Davis should develop a telecommunications infrastructure that is not dependent on any single medium, but incorporates a variety of media such as wireless and fiber	

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Utilities Policy Discussion

Plan, Policy, or Regulation	Project Consistency
optics as appropriate.	
City of Davis Municipal Code	
Article 40.42 WATER EFFICIENT LANDSCAPING **Section 40.42.020 Applicability.** (a) The provisions of this article shall apply to all of the following landscape projects within the City of Davis, except as otherwise noted: (1) Non-Residential Projects and Public Agency Projects. New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than two thousand five hundred square feet requiring a building or landscape permit, plan check or design review.	The City's water efficient landscape ordinance requirements will apply to the proposed project.