APPENDIX 4.10
WATER SUPPLY EVALUATION

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WEST YOST ASSOCIATES

TECHNICAL MEMORANDUM

DATE: August 20, 2019 Project No.: 694-12-17-03

SENT VIA: EMAIL

TO: Shabnam Barati, Barati Consulting, Inc.

FROM: Elizabeth Drayer, P.E., RCE #46872

SUBJECT: Water Supply Evaluation for UC Merced 2020 Long Range Development Plan

The Water Supply Evaluation (WSE) for the UC Merced 2020 LRDP was prepared in early 2019 by West Yost Associates using population and building space estimates developed by the Campus in late 2018. During the course of 2019, the Campus determined that it was unlikely to develop the amount of the previously projected building space and unlikely to add the number of faculty and staff that was previously estimated in 2018.

Specifically, instead of adding 2.58 million gross square feet (gsf) of building space under the 2020 LRDP such that the total on-campus space would be 5.04 million gsf by 2030 (see Table 2-1 in the WSE), the Campus determined that it would add about 1.83 million gsf between 2020 and 2030 under the proposed LRDP so that the total on-campus building space would be 4.29 million gsf.

Similarly, the Campus estimated that instead of faculty and staff increasing to 2,706 persons by 2030 (see Table 2-3 in the WSE), campus employment would increase to 2,411 faculty and staff by 2030. As a result, the total campus population would increase to 17,411 persons by 2030, and not to 17,706 persons as analyzed in the WSE. This smaller increase in campus population would result in a smaller increase in water demand by 2030. Under the reduced campus population of 17,411 persons, the projected water demand would be 612 acre-feet per year, which is less than the projected demand of 623 acre-feet per year shown in the WSE (see Table 2-3 in the WSE).

As a higher water demand estimate was used to complete the WSE, and the new water demand number is lower, the WSE provides a conservative analysis of the impact of the 2020 LRDP on water supply.

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2020 Long Range Development Plan

Water Supply Evaluation

Prepared for

University of California Merced

August 2019

WEST YOST ASSOCIATES
Consulting Engineers

694-12-17-03

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WEST YOST ASSOCIATES
consulting engineers

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AUGUST 2019

2020 Long Range Development Plan

Water Supply Evaluation

Prepared for

University of California Merced

Project No. 694-12-17-03

Project Manager: Elizabeth T. Drayer, PE	08/14/19 Date
QA/QC Review: Jim Connell, PE	08/14/19 Date

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EXECUTIVE SUMMARY

The purpose of this Water Supply Evaluation (WSE) is to perform an evaluation of the availability and reliability of water supplies to serve development completed to date and future planned development under the University of California Merced (UCM) 2020 Long Range Development Plan (LRDP). This evaluation is based on existing UCM water demands, water use trends, projected water demands for the future planned development under the 2020 LRDP and available water supplies from the City of Merced (City). The previous LRDP was adopted in 2009 and outlined planned development to accommodate UCM's growth; however, the 2020 LRDP has been developed to better reflect the current condition of the campus and revised growth projections.

The 2020 LRDP substantially revises the 2009 LRDP with the objective of accommodating projected increases in programs and providing appropriate space and infrastructure for existing and new initiatives on the campus, while allowing for more flexibility in the manner in which facilities are added to the campus to serve the projected enrollment. This revision was primarily performed because UCM is growing at a slower pace than previously anticipated and because 211 acres have been added to the campus site/planning area since the 2009 LRDP was prepared. The 2020 LRDP is currently predicting a population of 15,000 students by 2030, which is less than the 25,000 students previously predicted in the 2009 LRDP. The final projected buildout of the 2020 LRDP is anticipated to be completed by approximately 2030.

Projected Water Demands

The previously projected water demands for UCM included in the City's 2015 Urban Water Management Plan (UWMP) were based on UCM's previously estimated full development demand of 1,406 acre-feet per year (AFY). The 1,406 AFY was based on the projected 2030 campus population estimate (including students, faculty and other academic personnel and staff) in the 2009 LRDP and an estimated per capita demand factor of 39 gallons per capita per day (gpcd) developed in the City's 2014 Water Master Plan which was based on campus water use from 2007 to 2012.

A revised water use factor was used to project demands for the 2020 LRDP due to observed changes in campus water use since 2012. A revised water use factor of 31.4 gpcd was used based on the 10-year average per capita water use on the UCM campus from 2008 to 2017. This period includes both hydrologic dry and wet years. Using this factor and the revised campus population projections for the UCM campus, the projected water demands for UCM are estimated to be approximately 623 AFY by 2030. This projection includes demands for the 815-acre campus addressed in the 2009 LRDP, as well as 211 additional acres that were not included in the 2009 LRDP.

Water Supply Availability and Reliability

The currently projected water demand of approximately 623 AFY in 2030 for the UCM 2020 LRDP is considerably lower than the full development demand of 1,406 AFY previously estimated in the 2009 LRDP and included in the City's 2015 UWMP. The City's water supply was expected to meet UCM's demands as projected in the 2015 UWMP with no shortages. Therefore, since the demand projections are anticipated to be significantly lower under the revised growth projections of the 2020 LRDP, the City's water supply is expected to meet UCM's demands in 2030.

As described in Section 7 of this Water Supply Evaluation, the City does not project water supply shortages in its 2015 UWMP. Even though the City does not project shortages, UCM plans to achieve "water neutrality" and reduce water use so that no new water resources are needed to supply the campus. While UCM recognizes that in the near-term it is not feasible to reduce its net water consumption to zero, UCM remains committed to reduce water demands as much as possible.

1.0 INTRODUCTION

The University of California Merced (UCM) 2020 Long Range Development Plan (LRDP) will provide a comprehensive framework for the physical development of the UCM campus required to accommodate a student population of 15,000 by 2030. A LRDP was adopted in 2009 to accommodate UCM's growth; however, the 2020 LRDP has been developed to reflect the current condition of the campus and revised growth projections. The 2020 LRDP covers development of the 815-acre campus, which is located northeast of the City of Merced (City), as well as 211 additional acres that were not included in the 2009 LRDP. Due to these significant changes from the 2009 LRDP, a Subsequent Environmental Impact Report (SEIR)[1] will be prepared for the 2020 LRDP. This Water Supply Evaluation was prepared in support of the SEIR.

1.1 Legal Requirement for Completion of a Water Supply Assessment

California Senate Bill 610 (SB 610) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 sought to promote more collaborative planning between local water suppliers and cities and counties. The statute requires detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. 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 existing demands, anticipated demands from approved projects and tentative maps, and the demands of proposed projects.

SB 610 amended California Water Code sections 10910 through 10915 (inclusive) to require land use lead agencies to:

- Identify any public water purveyor that may supply water for a proposed development project; and
- Request a Water Supply Assessment (WSA) from the identified water purveyor.

The purpose of a WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the proposed development, while still meeting the water purveyor's existing and planned future uses. Water Code sections 10910 through 10915 delineate the specific information that must be included in the WSA.

Although the SB 610 requirements do not specifically apply to UCM, because it is not a city or a county, UCM has voluntarily elected to prepare a WSA-like document, a Water Supply Evaluation, to determine and demonstrate the sufficiency of the City's water supplies to satisfy the water demand of the planned development under the 2020 LRDP.

The City prepared an Urban Water Management Plan (UWMP) in 2015[2], which evaluated the projected water demands and available water supplies for the City, including demands for UCM.

[1] UC Merced 2018 LRDP Administrative Draft SEIR, prepared by Impact Sciences, February 2018.
[2] City of Merced 2015 Urban Water Management Plan, prepared by Carollo Engineers, November 2017.

1.2 Water Supply Evaluation Purpose, Format and Organization

The purpose of this Water Supply Evaluation is to perform an evaluation of the availability and reliability of water supplies to serve development completed to date and future planned development under the UCM 2020 LRDP, based on existing UCM water demands, water use trends, projected water demands for the future planned development under the 2020 LRDP, and available water supplies from the City.

Evaluation criteria and assumptions used for this Water Supply Evaluation are consistent with those used by the City in its 2015 UWMP. Furthermore, this Water Supply Evaluation has been prepared and organized to parallel and be consistent with the requirements for a WSA per Water Code sections 10910 through 10915, such that this evaluation provides a comprehensive and up-to-date evaluation of the availability and reliability of water supplies to serve the planned development.

This Water Supply Evaluation includes the following sections:

- Section 1: Introduction
- Section 2: Description of Proposed Project
- Section 3: Required Determinations
- Section 4: City of Merced and UC Merced Water System
- Section 5: City of Merced and UC Merced Water Demands
- Section 6: City of Merced Water Supplies
- Section 7: Determination of Water Supply Sufficiency Based on the Requirements of SB 610
- Section 8: Evaluation Findings
- Section 9: References

Relevant citations of Water Code sections 10910 through 10915 are included throughout this Water Supply Evaluation in italics to demonstrate compliance with the specific requirements of SB 610.

The purpose of this Water Supply Evaluation is not to reserve water, or to function as a "will serve" letter or any other form of commitment to supply water (see Water Code section 10914). The provision of water service will continue to be undertaken in a manner consistent with applicable City policies and procedures, consistent with existing law.

This Water Supply Evaluation will be included as an appendix to the Draft SEIR for the proposed 2020 LRDP, and the conclusions reached in this document will be considered in analyzing the project's potential impacts on water supply.

2.0 DESCRIPTION OF PROPOSED PROJECT

In March 2009, the University of California Regents adopted the UCM 2009 LRDP, which identifies UCM's campus goals and development objectives. However, due to the following reasons, the University has decided to prepare an updated LRDP that better reflects UCM's future development[3]:

- 211 acres have been added to the planning area since the 2009 LRDP was prepared;
- UCM is expected to grow at a slower pace than previously anticipated. UCM is currently predicting a population of 15,000 students in 2030, instead of the previous projection of 25,000 students in 2030;
- The 2009 LRDP was largely based on specific land use designations that were too restrictive to allow for flexible growth of UCM; and
- UCM determined that an updated LRDP should be prepared with compact, sustainable growth as the primary goal to lessen infrastructure delivery costs.

The 2020 LRDP substantially revises the 2009 LRDP with the objective of accommodating projected increases in programs and providing appropriate space and infrastructure for existing and new initiatives on the campus, while allowing for more flexibility in the manner in which facilities are added to the campus to serve the projected enrollment growth.

2.1 Objectives of the 2020 LRDP

The overarching objective of the 2020 LRDP is to continue the growth of UCM as a premier research university, consistent with the University of California's mission of teaching, research, and service excellence. The need for the 2020 LRDP is to provide an up-to-date land use plan to guide the physical planning and development of the next phase of campus growth from about 8,000 to 15,000 students, as well as to establish a paradigm for the campus' character.

The following are the specific project objectives that will facilitate accomplishment of the overarching project objective:

- Meet anticipated increases in enrollment demand for the University of California system, both short-term and long-term;
- Reduce the costs of the next phase of campus development by providing for a compact, pedestrian-oriented campus that reduces the need for new infrastructure;
- Plan and develop the campus to facilitate faculty-student interaction, ease and enjoyment of use of academic facilities, and an environment conducive to learning;
- Offer attractive and centrally located on-campus housing, consistent with UC-wide student housing policies;
- Provide opportunities for on-campus academic field research;

[3] UC Merced 2018 LRDP Administrative Draft SEIR, prepared by Impact Sciences, February 2018.

- Provide sufficient athletic facilities to offer high-quality NCAA, recreational, and club athletic programs commensurate with other premier universities;
- To the extent practicable, plan and develop the campus with sustainable design by incorporating energy efficiency, water conservation, protection of biological resources, waste reduction and minimization, on-site stormwater management and reduced dependence on automobiles; and
- Promote community integration and reflect the landscape, history, resources, and diverse cultures of the San Joaquin Valley in terms of physical development.

To meet the 2020 LRDP objectives, UCM will have to continue to develop its campus. Currently, the UCM campus has approximately 1.3 million gross square feet (gsf) of building space and is projected to expand to 5 million gsf by 2030, as shown in Table 2-1.

Table 2-1. 2017, 2020, and 2030 Building Space (gsf)[(a)]

Type	2017 Building Space	Projected 2020 Building Space	Proposed 2030 Building Space
Academic	695,143	1,269,588	2,002,000
Housing	434,515	848,198	1,648,000
Student Life and Athletics	82,455	247,026	1,207,000
Campus Operations	61,325	94,236	185,000
Totals	1,273,438	2,459,048	5,042,000

(a) Building space values from Table 3.0-2 in UC Merced 2018 LRDP Administrative Draft SEIR (February 2018).

2.2 Projected Water Demand

The water demands for UCM included in the City's 2015 UWMP were based on population projections (including students, faculty and other academic personnel and staff) from the 2009 LRDP and an estimated water use factor of 39 gallons per capita per day (gpcd). This 39 gpcd water use factor is the average of UCM's per capita water use from 2007 to 2012. However, due to changes in water use in the past 5 years, a revised water use factor was estimated to project water demands for the 2020 LRDP.

Table 2-2 presents UCM's per capita water use from 2008 to 2017. Per capita water use was highest in 2009 at 47.8 gpcd, and has generally decreased over the past 10 years to a low of 24.4 gpcd in 2017. This trend is likely due to water conservation measures and conservation-minded behavior in response to State legislation and the recent drought. While some of these measures are expected to remain in place, it is possible that per capita water use will rebound (increase) somewhat from the value observed in 2017. Because the 10-year period from 2008 to 2017 includes both hydrologic dry and wet years, the average per capita water use of 31.4 gpcd over this period was used to project UCM's future water demands under the 2020 LRDP.

Table 2-2. Historical UC Merced Per Capita Water Use

Year	UCM Annual Water Use, MG[(a)]	Campus Population[(b, c, d)]	Per Capita Water Use, gpcd
2008	59.8	3,576	45.8
2009	75.8	4,342	47.8
2010	64.1	5,397	32.5
2011	59.3	6,295	25.8
2012	73.0	6,976	28.7
2013	89.2	7,496	32.6
2014	75.8	7,676	27.1
2015	73.9	8,146	24.8
2016	79.3	8,812	24.6
2017	84.6	9,499	24.4
		Average	31.4

(a) Water use data is from UC Merced water - google docs.pdf received from Impact Sciences on 9/21/18 (see Appendix A).
(b) Population data from 2008 to 2012 is from Table 4-7 of the City's Water Master Plan, prepared by AECOM, January 2014.
(c) Population data for UC Merced students from 2013 to 2017 is from Historical Enrollment Graph - Fall Term, IPA Enrollment Table, received from Impact Sciences on 10/2/18 (see Appendix A).
(d) Population data for UC Merced employees from 2013 to 2017 is from Employee Headcounts, EMP COMPOSITE HIST Table, received from Impact Sciences on 10/2/18 (see Appendix A).

Actual 2017 water demands for UCM, previously projected campus demands from the 2015 UWMP, and estimated 2030 water demands under the growth assumptions of the 2020 LRDP are summarized in Table 2-3. The projected water demand for buildout of the 2020 LRDP is estimated to be approximately 623 AFY. The 2015 UWMP had a much higher projected water use for UCM (1,406 AFY) because, when it was prepared, it was anticipated that the campus would have a larger buildout population and a higher per capita water use by 2030.

Table 2-3. UC Merced Current and Projected Water Demands[a]

Type	Existing		2009 LRDP and 2015 UWMP		2020 LRDP	
	2017 Population	2017 Actual Water Use, AFY[b]	2030 Population Projection[c]	2030 Projected Water Use, AFY[d]	2030 Population Projection	2030 Projected Water Use, AFY[e]
Students	7,967	-	25,000	-	15,000	528
Faculty and Other Academic Personnel	390	-	1,732	-	723	25
Staff[f]	1,142	-	4,828	-	1,983	70
Total	9,499	259	31,560	1,406[g]	17,706	623

(a) From Table 3.0-1 of the UC Merced 2018 LRDP Administrative Draft SEIR (February 2018).
(b) From UC Merced water - google docs received from Impact Sciences on 9/21/18 (see Appendix A).
(c) From Table 2 of the UC Merced 2009 LRDP.
(d) City of Merced 2015 UWMP 2030 Projected Water Use for UC Merced Table 4-3.
(e) Calculated using the 31.4 gpcd water use factor from Table 2-2.
(f) The number of staff shown represents on-campus staff. UCM also has approximately 300 staff who work off-campus; however, they are not covered by the 2020 LRDP.
(g) Projected water use for the 2009 LRDP, if calculated, would differ slightly from the value presented in Table 4.3 of the City's 2015 UWMP (1,379 AFY vs. the 1,406 AFY value presented in the 2015 UWMP). This is due to an arithmetic error in Table 2 of the UC Merced 2009 LRDP which was carried over into the 2015 UWMP. The 2015 UWMP value (1,406 AFY) is used in this evaluation for consistency.

3.0 REQUIRED DETERMINATIONS

This section describes the required determinations for a WSA.

3.1 Does SB 610 apply to the Proposed Project?

Cities and counties are the only lead agencies specifically required by SB 610 to prepare a water supply assessment for certain projects. Although the SB 610 requirements do not specifically apply to UCM because it is not a city or county, the University has voluntarily elected to prepare a WSA-like document to determine and demonstrate the sufficiency of the City's water supplies to satisfy the water demand of the planned development under the 2020 LRDP.

This Water Supply Evaluation has been prepared to document the projected water demands for the UCM campus to be developed under the 2020 LRDP and to demonstrate that adequate water supplies are available to meet the projected UCM water demands. For completeness and clarity, this Water Supply Evaluation has been prepared to comply with SB 610 requirements for a WSA, although SB 610 does not apply to campus development under the 2020 LRDP.

3.2 Who is the Identified Public Water System?

10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project

10912 (c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections…

The UCM campus is located within the City of Merced's water service area; therefore, the City of Merced is the public water system for the proposed project.

3.3 Does the City have an adopted Urban Water Management Plan (UWMP) and does the UWMP include the projected water demand for the Proposed Project?

10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

The City's 2015 UWMP was adopted by the Merced City Council on December 18, 2017. The City's 2015 UWMP includes existing and projected water demands for UCM. The potable water demand projections included in the City's 2015 UWMP are summarized in Table 3-1.

Table 3-1. Potable Water Demands Included in the City of Merced 2015 UWMP

	2015 (actual)[a]	2020	2025	2030	2035
Total Demand, AFY[b]	17,855	25,486	27,466	30,006	31,960
UC Merced, AFY[b]	227	562	889	1,406	1,406
UC Merced Demand, as Percent of Total City Demand	1.3%	2.2%	3.2%	4.7%	4.4%

(a) 2015 actual demands from City's 2015 UWMP (Table 4-2).
(b) Projected demands for 2020 to 2035 from City's 2015 UWMP (Table 4-3).

The water demands for UCM included in the City's 2015 UWMP were based on campus population projections from the 2009 LRDP and an estimated water use factor of 39 gpcd.[4] The 39 gpcd estimate is the average of UCM's per capita water use from 2007 to 2012.

As shown in Table 2-3, the projected water demand for buildout of the 2020 LRDP is estimated to be approximately 623 AFY. This projected water demand is less than half of what was previously projected for the campus. The 2015 UWMP had a much higher projected water use for UCM (1,406 AFY) because, when it was prepared, it was anticipated that the campus would have a larger buildout population and a higher per capita water use by 2030.

[4] City of Merced Water Master Plan, prepared by AECOM, January 2014.

4.0 CITY OF MERCED AND UC MERCED WATER SYSTEM

The descriptions provided below for the City's water system have been taken, for the most part, from the City's 2015 UWMP.

4.1 Water Service Area

The City of Merced's city limits encompass 23.1 square miles, while the City's Sphere of Influence (SOI) encompasses 44.7 square miles, including the UCM campus. The City's water service area consists of the City limits and the UCM campus. The City is the only water supplier for customers in the City limits, the UCM campus, and some small county islands outside of the city limits. A generalized map of the water service area is provided in Figure 4-1.

According to the City's 2015 UWMP, the current population residing in the City's water service area is estimated to be 92,101 people. Approximately 90 percent of the total population, almost 84,000 people, lives within the City limits.

The UCM campus is located on the northeast side of the City's SOI. The campus population currently consists of approximately 8,100 people, including students, faculty, staff, and their families. Only a portion of the campus population lives on campus, the rest commute from the City and the surrounding area.

4.2 Overview of Water Supply Sources

The City's potable water system relies solely on groundwater supplies, specifically those of the Merced Subbasin in the Central Valley. The City accesses the groundwater supply through 20 active and standby wells that range in depth from 60 to 230 feet. These wells and other important elements of the City's water supply system are illustrated in Figure 4-2.

4.3 Water Service to UC Merced

The City of Merced supplies water to UCM for domestic use, fire flow, and irrigation on campus. As shown in Table 3-1, UCM currently accounts for approximately 1.3 percent of the City's total annual water consumption.

The UCM campus receives potable water from the City through a 16-inch diameter transmission pipeline which runs from the northeast corner of the city limits to the southwest corner of the campus. The City also produces potable water used to serve the campus from Well 17, which is located on the campus. An on-campus potable water distribution system owned and maintained by UCM conveys potable water to each building. UCM also owns a pump station and a 250,000-gallon tank located near Well 17 that provides operational and emergency storage for the campus.

UCM also has a recycled water distribution network that extends to portions of the campus and is used for irrigation purposes. Currently, the recycled water system is connected to the potable water system via a backflow preventer near the campus pump station, and potable water from the City's 16-inch diameter transmission pipeline and Well 17 is delivered through the recycled water lines because there is no recycled water (or other non-potable) source available at this time. Once UCM is able to connect to a source of recycled water (or other non-potable) water supply, the recycled water system will be disconnected from the potable water system and switched to the non-potable supply[5].

[5] Information on UCM's recycled water system from Merced 2020 Project Water Network Basis of Design Report, prepared by ARUP, September 21, 2017.

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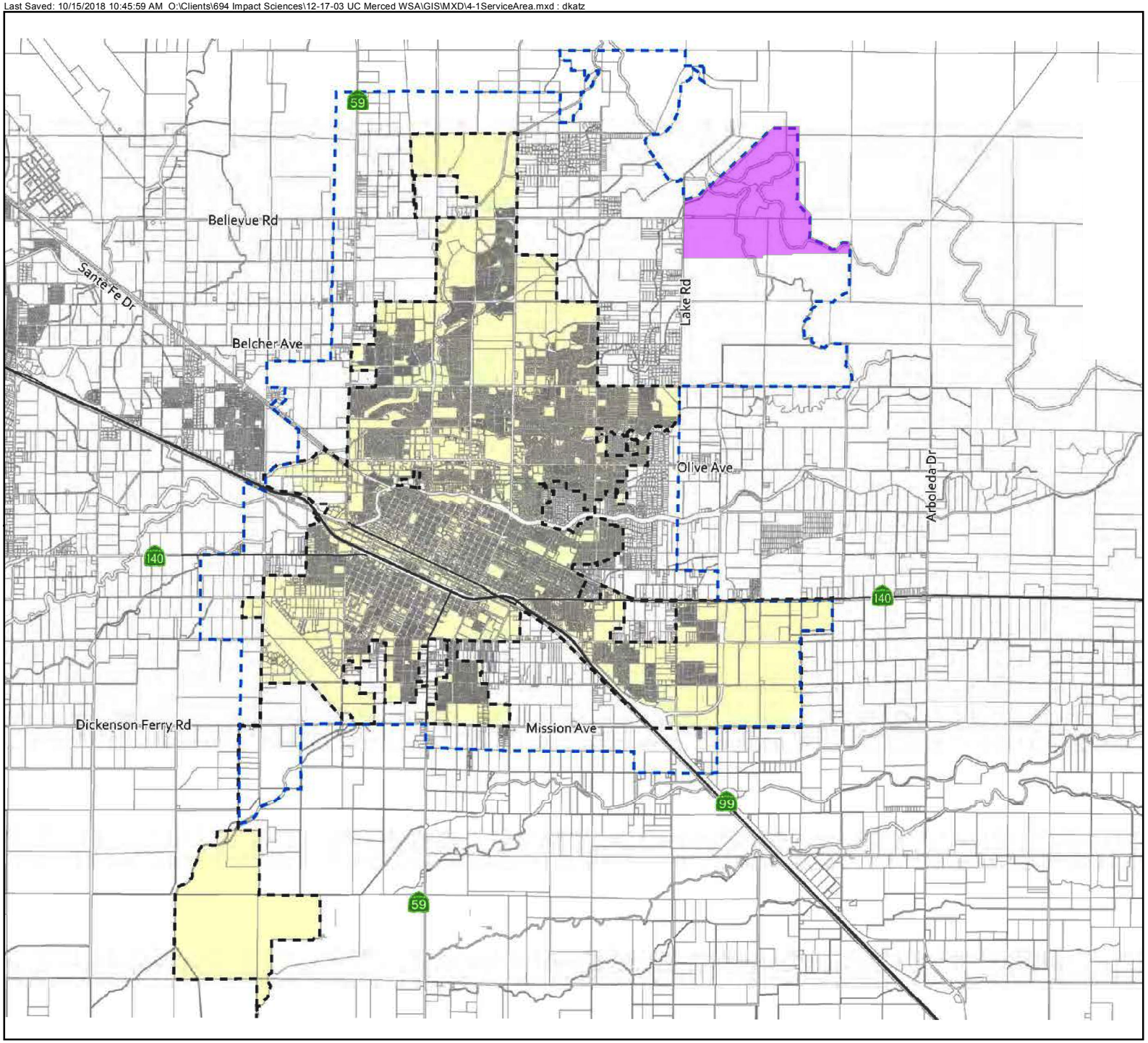

N

0 5,500 11,000

Scale in Feet

Symbology

- Major Highways
- General Plan Boundary
- City Limits
- Merced Water Service Area
- Parcels
- UC Merced

Notes:

1. Figure generated using Figure 3.2 from City of Merced 2015 UWMP by Carollo.
2. UC Merced Boundary based on Figure 2-1 from City of Merced Water Master Plan by AECOM.

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Figure 4-1

City of Merced Water Service Area

UC Merced Water Supply Evaluation

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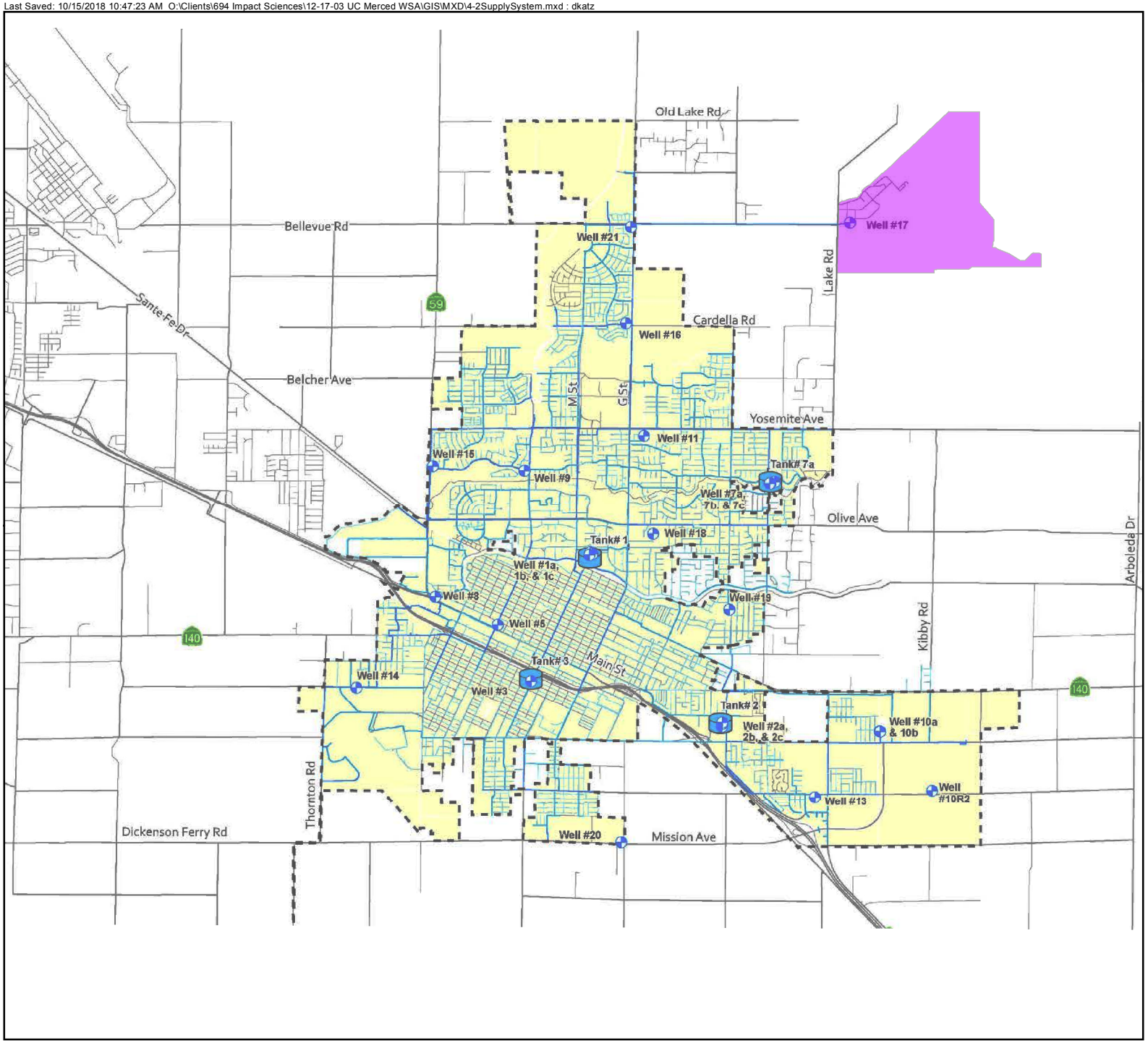

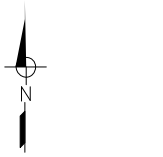

Symbology

- Streets
- City Limits
- Merced Water Service Area
- UC Merced
- Storage Tank
- Well

Diameter (inches)

- <=8
- 10-12
- 14-18
- => 20

Notes:

1. Figure generated using Figure 6.3 from City of Merced 2015 UWMP by Carollo.
2. UC Merced Boundary based on Figure 2-1 from City of Merced Water Master Plan by AECOM.

WEST YOST ASSOCIATES

Figure 4-2

City of Merced Water Supply System

UC Merced Water Supply Evaluation

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5.0 CITY OF MERCED AND UC MERCED WATER DEMANDS

10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

The descriptions provided below for the City's water demands have been taken, for the most part, from the City's 2015 UWMP, which was adopted by City Council in December 2017. Supplemental information from other available reports has been included to provide the most recent data available.

5.1 Historical and Existing Water Demand

Historically, the general trend of the City's water demand rose roughly in parallel with population. Around 1999, system demand began to decline, even though the population increased, due to metering and conservation measures. In 2015, after two years of water rationing in response to the drought, annual water use decreased to 173 gpcd, as shown in Table 5-1.

Table 5-1. City of Merced Historical Per Capita Water Demand[(a)]

Year	Annual Water Use, MG	City of Merced Population	Per Capita Water Use, gpcd
2007	7,949	80,259	271
2008	7,874	81,683	264
2009	7,594	82,772	251
2010	7,709	84,355	250
2011	7,533	85,858	240
2012	8,439	87,587	264
2013	8,951	89,246	274
2014	8,222	89,912	251
2015	5,818	92,101	173

(a) Historical water use and population from City's 2015 UWMP (Table 4-1).

Per capita water use on the UCM campus represents total campus potable water use divided by the campus population, which includes students (some of whom live on campus and others who live off campus), faculty and other academic personnel and staff. As shown in Table 2-2, historical per capita water demands for the UCM campus follow a trend similar to that of the City-wide demands shown in Table 5-1, and have declined since 2008.

5.2 Future Water Demand

In the 2015 UWMP, the City utilized a per capita water demand model based on historical annual water use and predicted population growth to forecast future demands for 2020 through 2035. As described above, the water demands for UCM included in the City's 2015 UWMP were based on campus population projections from the 2009 LRDP and an estimated water use factor of 39 gpcd.

Table 5-2 provides a summary of the City's future water demand projections for its various water use types.

Table 5-2. City of Merced Projected Water Demand, AFY[(a)]

Use Type	2015	2020	2025	2030	2035
Single Family	9,754	14,655	15,627	16,817	17,966
Multi-Family	2,883	3,291	3,510	3,777	4,035
Commercial/Institutional	2,311	3,088	3,293	3,543	3,785
UC Merced	**227**	**562**	**889**	**1,406**	**1,406**
Industrial	353	399	426	458	490
Landscape	900	1,496	1,595	1,717	1,834
Losses	1,427	1,994	2,126	2,288	2,444
Total	**17,855**	**25,485**	**27,466**	**30,006**	**31,960**

(a) Demands from City's 2015 UWMP (Table 4-2 and 4-3).

6.0 CITY OF MERCED WATER SUPPLIES

10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).

10910(d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts

10910(d)(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

(A) Written contracts or other proof of entitlement to an identified water supply.

(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.

(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.

(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

10910(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contract-holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.

The descriptions provided below for the City's water supplies have been taken, for the most part, from the City's 2015 UWMP, which was adopted by City Council in December 2017. Supplemental information from other available reports has been included in this WSE to provide the most recent data available and to match the specific requirements of SB 610.

6.1 Existing City Water Supplies

The Merced water system relies solely on local groundwater, which the City pumps from the Merced Subbasin aquifer using groundwater extraction wells. In the future, the City plans to use more recycled and raw water and to acquire surface water from Merced Irrigation District (MID).

6.1.1 Surface Water Supplies

The City does not currently have any surface water supplies. In the future, the City plans to transfer and exchange surface water with MID for irrigation. To accomplish this, the City will need to construct a surface water treatment plant to treat the surface water from MID. See Section 6.2.1 for a discussion of the planned transfer and exchange programs.

6.1.2 Groundwater

Groundwater accounted for 100 percent of the City's potable water supply in 2015, and will continue to be the City's primary source of potable water for the foreseeable future. The City's well system consists of 20 production wells and local water treatment facilities at the wells. These wells vary in depth from 60 to 230 feet deep and have a total capacity of 54,100 gallons per minute.

6.1.2.1 Basin Description

The City pumps groundwater from the Merced Subbasin (Subbasin 5-22.04), which is located in the San Joaquin Groundwater Basin (Basin Number 5-22). The entire production of the City's well system is derived from this subbasin, which is the primary groundwater aquifer underlying the City. This subbasin covers a surface area of approximately 491,000 acres (CA DWR, Bulletin 118), and the groundwater in the subbasin is predominately of a bicarbonate type. The subbasin does have localized water quality impairments, including high hardness, iron, nitrate, and chloride.

The groundwater aquifer from which the City obtains its water is not adjudicated, and because of this there are no defined legal pumping rights for the City and there are no legal constraints on groundwater pumping. However, the City's ability to pump groundwater may be impacted in the future due to the Sustainable Groundwater Management Act of 2014 (SGMA). DWR has estimated that the natural recharge into the basin to be 47,000 AF.

Groundwater from the subbasin is used by the City (including UCM), other water districts and private users.

6.1.2.2 Overdraft Conditions

The 2003 Update to DWR Bulletin 118 identified eleven groundwater basins, including the Merced Subbasin, as being in a critical state of overdraft. These eleven groundwater basins were originally identified as overdrafted by DWR in the 1980 publication of DWR Bulletin 118. No additional analysis was performed to update the status of the eleven groundwater basins for the 2003 Update to DWR Bulletin 118, or to identify additional groundwater basins in a state of critical overdraft. However, in 2018, DWR compiled an updated draft list of critically overdrafted basins to the California Water Commission, and the Merced Subbasin was included on the list.[6] Although the Merced Subbasin was classified as only mildly overdrafted in the 2008 Merced Area Groundwater Pool Interests (MAGPI) Groundwater Management Plan (GWMP) (discussed below in Section 6.1.2.3), DWR's classification of the Merced Subbasin as critically overdrafted will likely drive regional groundwater management policies for the next 20 years.

[6] Information on Basin Prioritization found on California Department of Water Resources website, https://water.ca.gov/Programs/Groundwater-Management/Basin-Prioritization

6.1.2.3 Groundwater Management

To meet the requirements of the 1993 Groundwater Management Act (AB 3030), MAGPI entered into a Memorandum of Understanding (MOU) with the California DWR to support water management programs. In 1997, MAGPI published a GWMP update that describes the Merced Subbasin's physical characteristics, water quality conditions, and methods to sustain groundwater. In 2008, MAGPI updated their GWMP to address the legislative requirements of SB 1938 and SB 1672. The goal of these updates was to monitor, protect, and sustain groundwater in the Merced Subbasin.

The California Statewide Groundwater Elevation Monitoring (CASGEM) program provides a ranking of groundwater basin importance. Under the CASGEM program, the Merced Subbasin is ranked as high priority. Prioritization is based on factors such as population, number of public supply wells, irrigated acreage, and reliance on groundwater.

The City recognizes the need to evaluate its groundwater supply and has assisted with overseeing the development of the Merced Integrated Regional Water Management Plan (MIRWMP) which was adopted in 2013. The MIRWMP has identified the correction of overdraft conditions as one of the highest priorities for the region. Both the GWMP and the MIRWMP identified various strategies to address overdraft in the subbasin, including groundwater recharge, water conservation and education, conjunctive use of water resources, wastewater reclamation and recycling, and construction and operation of additional facilities.

In 2014, the SGMA was signed into law to provide a framework for management of groundwater supplies by local agencies and restricts state intervention, if required. SGMA provides an opportunity for local agencies overlying the basin to form a Groundwater Sustainability Agency (GSA), which is the primary agency responsible for achieving sustainability. As part of the region's compliance with SGMA, the Merced Subbasin Groundwater Sustainability Agency (MSGSA) was formed in 2017, and includes representatives from the County of Merced, County of Mariposa, Le Grand-Athlone Water District, Merquin County Water District, Plainsburg Irrigation District and Stevinson Water District.[7] This GSA is tasked with adopting a Groundwater Sustainability Plan (GSP) within five to seven years, as the Merced Subbasin has been identified as being in a state of overdraft and is considered a high priority. It is anticipated that the GSP and other regulatory requirements of SGMA will impact the City's water supply; however, the exact nature and extent of the impact is not currently known.

[7] Information on Merced Subbasin Groundwater Sustainability Agency found on their website, https://www.co.merced.ca.us/2255/Merced-Subbasin-GSA

6.1.2.4 Groundwater Pumping

Table 6-1 below shows the actual volume pumped from the City's wells from 2011 to 2015. The average annual volume pumped over this period is roughly 23,900 AFY.

Table 6-1. City of Merced Groundwater Volume Pumped[(a)]

	2011	2012	2013	2014	2015
Merced Subbasin 5-22.04, AFY[(a)]	23,117	25,899	27,469	25,234	17,855

(a) City of Merced 2015 UWMP, Table 6-2.

6.2 Additional Planned Future City Water Supplies

The City recognizes that it will need to diversify its water supply and develop sources of water other than groundwater to sustain its projected population growth.

6.2.1 Transfers and Exchanges

The City plans to exchange recycled water for untreated surface water from MID, beginning in 2020. The untreated surface water from MID is to be used to irrigate a number of landscaped areas within the City. This exchange would offset the need to construct 12 miles of recycled water pipeline and pump stations from the City's wastewater treatment facility (WWTF).

The City's 2014 Water Master Plan identifies that the City needs to increase its water supply in the future. The recommended alternative to increase supply involves the construction of a 10 million gallon per day Surface Water Treatment Plant (SWTP) by 2030 that will receive untreated surface water from MID. The City expects to receive an average of 4,000 AFY from MID.

6.2.2 Recycled Water

The City's WWTF is capable of producing 12 mgd of tertiary filtered wastewater, which may be used for a variety of non-potable uses. The City currently does not have the infrastructure to distribute the recycled water produced at the WWTF throughout the City. The City currently uses recycled water for flushing out sewer and storm drains, irrigating landscapes and agriculture, and maintaining wildlife areas. The City will also provide residents with recycled water if they come to collect it at the WWTF. The City anticipates an increase in recycled water use in the future, primarily by agricultural users.

UCM mentions in the 2009 LRDP that it may receive recycled water from the City in the future for use in the campus's existing recycled water distribution system, which is currently using potable water. However, the City's 2015 UWMP states that the City does not have plans to transfer recycled water to UCM. Therefore, it is unclear whether recycled water will be available for use on the UCM campus in the future.

6.3 Summary of Existing and Additional Planned Future City Water Supplies

Table 6-2 provides a summary of the City's existing and projected water supplies in normal years.

Table 6-2. City of Merced Existing and Projected Normal Year Water Supplies, AFY[(a)]

Supply Source	2015	2020	2025	2030	2035
Groundwater	17,855	25,486	27,408	25,901	27,807
Exchanges	-	-	58	105	153
Transfers	-	-	-	4,000	4,000
Recycled Water	4,886	5,774	5,821	5,869	5,869
Total	22,741	31,260	33,287	35,875	37,829

(a) City of Merced 2015 UWMP, Tables 6-11 and 6-12.

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7.0 DETERMINATION OF WATER SUPPLY SUFFICIENCY BASED ON THE REQUIREMENTS OF SB 610

Water Code section 10910 states:

10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

7.1 Overview of Water Supply Constraints

The City of Merced is facing a variety of circumstances that can impact the reliability of its water supply. Determining the supply reliability for the City is difficult because of the complex factors that accompany its water supply sources. The constraints include the following:

- **Legal:** The supplies the City relies upon are neither in the process of adjudication nor the subject of any new legislation limiting them. Therefore, the City does not anticipate legal factors influencing the reliability of groundwater within the near term. However, that could change in the future with the implementation of the Sustainable Groundwater Management Act (SGMA).
- **Environmental:** The status of environmental regulation in California is routinely changing due to new legislation, endangered species statuses, and other factors. Should new environmental legislation be passed, it could potentially impact the City's available supply. The recent water supply reductions in the Delta are an example of environmental water needs competing with community water supplies. The City does not anticipate environmental factors influencing groundwater reliability.
- **Water Quality:** The GWMP identified multiple groundwater quality concerns in the area. Contaminants identified include groundwater salinity, nitrate, iron, manganese, arsenic, radio-nucleotides, bacteria, petroleum hydrocarbons, pesticides, trichloroethylene, and perchloroethylene. The groundwater quality is fairly consistent and meets the applicable water quality recommendations. However, as testing methods improve and regulations become more stringent, the City's groundwater may require additional treatment in the future.
- **Climate Change:** Climate change may add many new uncertainties to the challenges of planning, and changes in weather could potentially affect water supply planning. Since climatic pressures could potentially affect supply reliability, continual attention to this issue will be necessary in the future.

7.1.1 Groundwater Reliability

The City of Merced relies solely on groundwater for its potable water supply, which is not as affected by annual runoff fluctuations as is surface water. The City's wells pump from a non-adjudicated groundwater basin (Merced Subbasin) with no limits on pumping. However, the Merced Subbasin has been identified as being in a critical state of overdraft. Therefore, the future reliability of the groundwater supply for the City will depend on the long-term balance of

groundwater extraction and recharge for the subbasin as a whole. The City, as part of MAGPI and the MSGSA, does have plans to address the overdraft condition, which are discussed in Section 6.1.2.3.

7.1.2 Recycled Water Reliability

Recycled water is considered a reliable source of water. However, because the availability of recycled water supplies is dependent upon the amount of indoor residential use, the availability of recycled water can be limited in times of water conservation. However, based on the City's projected recycled water demand, the City's future recycled water supplies in the future are expected to be reliable during drought years.

Currently, the amount of recycled water that can be delivered to the City's customers is limited due to the lack of recycled water infrastructure. However, the amount of recycled water the City intends to use for beneficial purposes is expected to increase in the future as additional infrastructure is built and wastewater generation increases.

7.2 Supply and Demand Comparison

The City's 2015 UWMP compared available supply and demand for the City under three hydrologic scenarios: a normal year, a single dry year, and a multiple dry year period. The City determined that 2010 was a representative normal year based on a review of water supply records from 1978 to 2015. Rainfall data indicate that 2013 was the single driest year for the City. The recent drought from 2013 to 2015 was considered representative of a multiple dry year period.

The City continues to promote water conservation and, since 1993, mandatory prohibitions related to water conservation have remained in force. However, the City's Water Shortage Contingency Plan (WSCP) does not indicate a supply reduction goal during dry years. The City is in the process of updating its WSCP in an effort to establish specific reduction goals for multiple year drought stages.

7.2.1.1 Normal Year Supply and Demand Comparison

The City has not previously experienced shortages in normal water years. The City expects its available supply capacity to meet the projected normal year demands through 2035.

7.2.1.2 Single Dry Year Supply and Demand Comparison

Demands during a single dry year are anticipated to increase 10 percent above normal year demands to compensate for the lack of precipitation. In response, groundwater production is expected to increase. The City expects its available supply capacity to meet projected single dry year demands through 2035.

7.2.1.3 Multiple Dry Year Supply and Demand Comparison

In the first year of a multiple dry year period, demands are anticipated to increase 10 percent above normal year demands to compensate for the lack of precipitation. In the second year, demands are projected to fall back to near normal year levels as water conservation measures are

implemented. During the third year, surface water allocation is assumed to be zero, and a 30 percent reduction in both supply and demand is anticipated. The City expects its available supply capacity to meet projected multiple dry year demands through 2035.

Table 7-1 presents a summary of the City's projected demands and available supplies under normal year, single dry year and multiple dry year conditions.

Table 7-1. City of Merced Water Supply and Demand in Normal Years, Single Dry Years and Multiple Dry Years, AFY[(a)]

	2020	2025	2030	2035
Normal Year				
Supply Totals	31,260	33,287	35,875	37,829
Demand Totals	31,260	33,287	35,875	37,829
Difference	0	0	0	0
Demand Served, %	100%	100%	100%	100%
Single Dry Year				
Supply Totals	33,809	36,034	38,876	41,025
Demand Totals	33,809	36,034	38,876	41,025
Difference	0	0	0	0
Demand Served, %	100%	100%	100%	100%
Multiple Dry Years				
First Year				
Supply Totals	33,809	36,034	38,876	41,025
Demand Totals	33,809	36,034	38,876	41,025
Difference	0	0	0	0
Demand Served, %	100%	100%	100%	100%
Second Year				
Supply Totals	31,260	33,287	35,875	37,829
Demand Totals	31,260	33,287	35,875	37,829
Difference	0	0	0	0
Demand Served, %	100%	100%	100%	100%
Third Year				
Supply Totals	23,614	25,047	26,873	28,241
Demand Totals	23,614	25,047	26,873	28,241
Difference	0	0	0	0
Demand Served, %	100%	100%	100%	100%

(a) City of Merced 2015 UWMP, Tables 7-2, 7-3, 7-4, and 7-5.

7.3 City of Merced Water Shortage Contingency Plan

The City's WSCP has four stages which correspond with supply reductions ranging from 0 percent to 50 percent. Each stage includes a set of demand reduction measures that become progressively more stringent as the shortage condition escalates.

The City's strategy for dealing with water shortages of all levels involves the following interrelated components:

- Prohibitions and restrictions for end users;
- Penalties for not meeting prohibitions or restrictions; and
- Consumption reduction methods.

The majority of prohibitions and restrictions the City has in place are enacted at all times to conserve water. At Stages 2 and 3 of the WSCP, landscape irrigation is limited to a specified schedule, and landscape irrigation is prohibited entirely at Stage 4. The City issues penalties for not following the restrictions or prohibitions, beginning with a warning and followed by fines which increases in cost based on the number of user violations. The City is attempting to raise public awareness of water use and encourages conservation. When the City escalates to higher stages of the WSCP it begins to offer water use surveys, decrease water line flushing, provide rebates on water efficient plumbing, and increase water waste patrols.

Because it is supplied water by the City, the City's WSCP applies to UCM under each shortage scenario.

7.4 UC Merced Water Conservation Measures

Consistent with State law that set a goal to reduce per capita water use by 20 percent in 2020[8], the UC Board of Regents in 2011 set a similar policy directing each campus to strive to reduce potable water consumption adjusted for campus population growth by 20 percent in 2020. In 2016, the UC Office of the President adopted a more ambitious goal mirroring a 2015 Executive Order covering federal facilities. It calls for campuses to demonstrate leadership in the area of sustainable water systems by reducing potable water use 35 percent by 2025, as compared to a 2005-2008 baseline period, using the same weighted campus user approach. Some of the actions called out in the policy include:

- Converting potable water used for irrigation to recycled water;
- Implementing efficient irrigation systems;
- Drought tolerant plant selections;

[8] The Water Conservation Act of 2009 (also known as SB X7-7); 20 percent reduction is based on historical baseline water use established for a 10-year continuous baseline period ending no earlier than December 31, 2004 and no later than December 31, 2010 based on guidelines set forth in the SB X7-7 provisions.

- Phasing out unused turf; and
- Replacing single-pass cooling systems or constant flow laboratory equipment.

As described in the April 2017 update to the 2009 LRDP, UCM plans to achieve "water neutrality" and reduce water use so that no new water resources are needed to supply the campus. While UCM recognizes that in the near-term it is not feasible to reduce its net water consumption to zero, UCM remains committed to reduce water demands as much as possible. UCM has implemented multiple projects to reduce water use, including[9]:

- Installing an evapotranspiration system that predicts weather conditions and reduces the amount of water needed for irrigation accordingly;
- Reducing irrigation of lawns and other landscaped areas to a level sufficient to minimize the growth of invasive weeds and to keep trees alive;
- Removing annual plants and replacing them with drought resistant species;
- Altering condenser plant operations to more efficiently cool the campus; and
- Developing a system where leaks on water fixtures can be reported by scanning a QR code on the fixture with a mobile device.

UCM plans to continue to research and implement new methods for conserving additional water and to lessen its water footprint in the future.

[9] University of California Water Watch, Facilities Management, Conservation Groundwater Sustainability Agency accessed on the UC Merced website, http://water.ucmerced.edu/conservation

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8.0 EVALUATION FINDINGS

The purpose of this Water Supply Evaluation is to perform an evaluation of the availability and reliability of water supplies to serve the planned development under the UCM 2020 LRDP based on existing UCM water demands and projected water demands for future development under the 2020 LRDP. Key findings of this Water Supply Evaluation are summarized as follows:

- Per capita water use for the UCM campus has declined significantly over the past 4 years. This trend is likely due to water conservation measures and conservation-minded behavior in response to State legislation and the recent drought. Because some of these conservation measures are likely to remain in effect, a per capita use factor of 31.4 gpcd, based on a 10-year average from 2008 to 2017, which includes both hydrologic dry and wet years, was used to project UCM's future water demands under the 2020 LRDP, as opposed to the 39 gpcd water use factor previously used in the City's 2015 UWMP.
- The revised 2030 population projection for the UCM campus is significantly less than the previous projection used in the 2009 LRDP. The 2020 LRDP assumes 15,000 students enrolled in 2030, while the 2009 LRDP assumed 25,000 students enrolled in 2030.
- The projected potable water demands for all UCM facilities, including the buildout of facilities under the UCM 2020 LRDP, are now projected to be approximately 623 AFY by 2030, which is considerably lower than the full development demand of 1,406 AFY previously estimated in the 2009 LRDP and included in the City's 2015 UWMP. The City's water supply was expected to meet UCM's demands as projected in the 2015 UWMP with no shortages. Therefore, since the demand projections are anticipated to be significantly lower under the revised growth projections of the 2020 LRDP, the City's water supply is expected to meet UCM's demands in 2030.
- As described in Section 7 of this Water Supply Evaluation, the City's WSCP includes permanent water conservation measures which are always in effect, as well as additional conservation measures which may be implemented by the City as needed. As a City water customer, UCM is required to comply with these conservation measures and is subject to the City's water supply allocation system and demand reduction measures.

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9.0 REFERENCES

City of Merced Water Master Plan, prepared by AECOM, January 2014.

City of Merced 2015 Urban Water Management Plan, prepared by Carollo Engineers, November 2017.

Merced 2020 Project Water Network Basis of Design Report, prepared by ARUP, September 21, 2017.

UC Merced Tomorrow: Long Range Development Plan, University of California, Merced, March 2009 (last amended April 2017).

UC Merced and University Community Project Draft Environmental Impact Statement/Environmental Impact Report Volume 2, prepared by Impact Sciences Inc., November 2008.

UC Merced and University Community Project Draft Environmental Impact Statement/Environmental Impact Report Volume 3, prepared by Impact Sciences Inc., November 2008.

UC Merced 2018 LRDP Administrative Draft SEIR, prepared by Impact Sciences Inc., 2018.

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APPENDIX A

UC Merced Population and Water Use Data

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UCMERCED UNIVERSITY OF CALIFORNIA Institutional Research and Decision Support

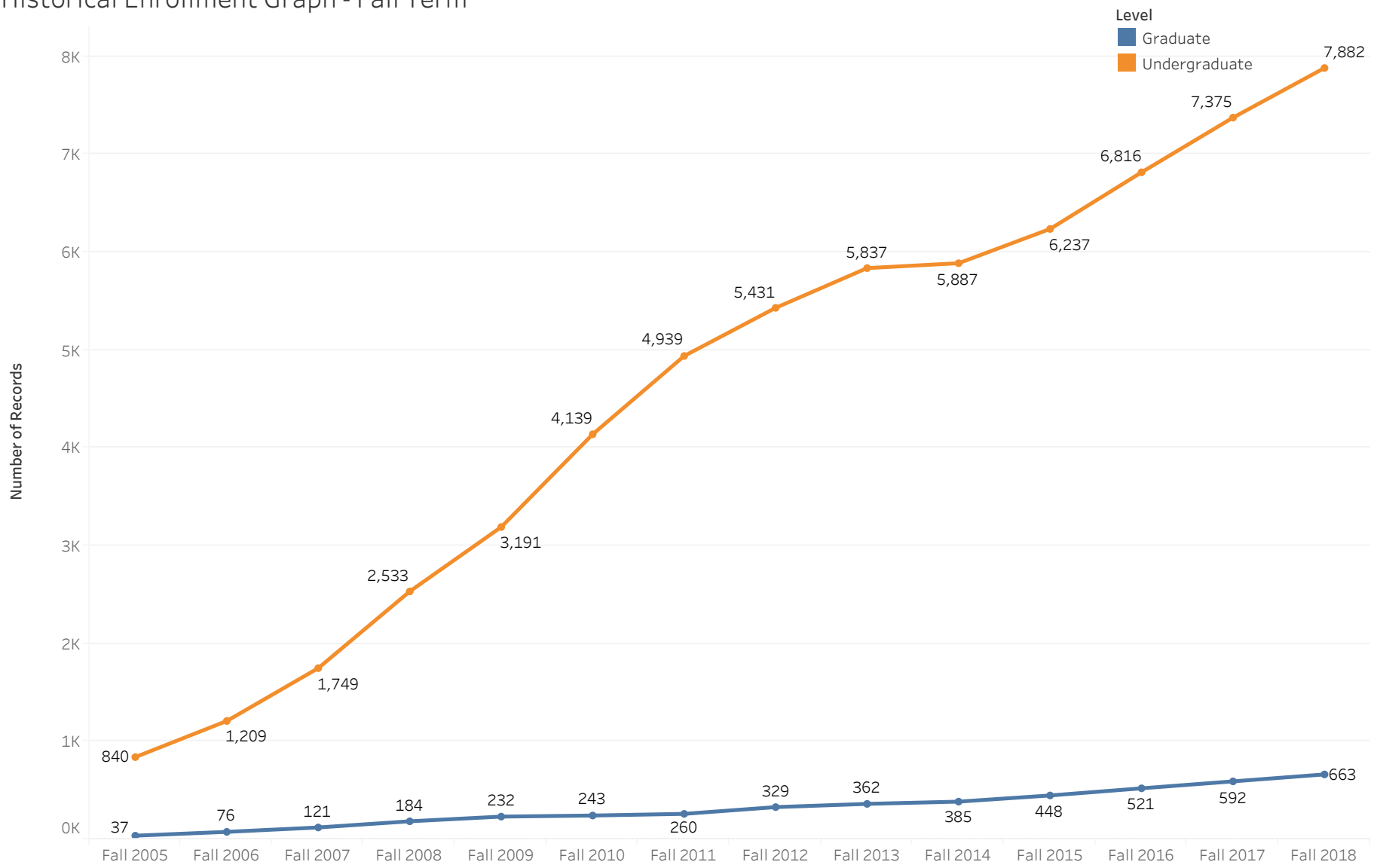
EMPLOYEE HEADCOUNTS

	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017
Faculty	327	347	374	368	390
Other Academic Appointments	72	82	94	96	114
Staff	898	975	993	1011	1025
Totals	**1,297**	**1,404**	**1,461**	**1,475**	**1,529**

Data Source: EMP COMPOSITE HIST Table
Prepared by Institutional Research & Decision Support

UCMERCED

Historical Enrollment Graph - Fall Term



Source: IPA Enrollment Table
Prepared by Institutional Research and Decision Support

Contact for data: Colleen McCormick (cmccormick3@ucmerced.edu), Zuhair Mased (zmased@ucmerced.edu), Breeana Sylvas (bsylvas@ucmerced.edu)

Fiscal Year Data

Date	Weighted Campus User (WCU)	Potable Water Use (gallons)	Per Capita Potable Water Use (gpy/WCU)	% Reduction from Baseline	Total Building Square Feet (GSF)	Non-Potable Water Use (gallons)	If available, please add metered use per category (gallons)					
							Buildings		Landscape		Central Plant	
							Potable (gallons)	Non-Potable (gallons)	Potable (gallons)	Non-Potable (gallons)	Potable (gallons)	Non-Potable (gallons)
FY05-06	1,459	51,290,000	35,154									
FY06-07	1,779	52,294,000	29,395									
FY07-08	2,099	53,297,000	25,392									
Policy Baseline			**29,980**		#DIV/0!							
2020 Policy Goal (20% Reduction)			**20,313**									
2025 Policy Goal (36% Reduction)			**19,187**									
Current Reduction From Baseline			58%									
Goal Met			YES									
FY17-18	7,191	92,230,076	12,826	57%								
FY16-17	6,801	85,168,014	12,523	58%								
FY15-16	6,566	73,008,184	11,119	63%	1,534,486		73,008,184		21,572,200	0	6,098,952	
FY14-15	6,660	82,663,000	12,412	59%	1,369,782	0	46,355,984	0	31,420,308	0		
FY13-14	6,270	84,319,000	13,448	55%								
FY12-13	5,746	76,350,000	13,288	56%								
FY11-12	5,065	72,228,000	14,260	52%								
FY10-11	4,398	63,651,000	14,473	52%								
FY09-10	3,505	64,503,000	18,403	39%								
FY08-09	2,922	69,803,000	23,889	20%								

Potable Water Data in Gallons per Month

Month	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	1,002,320	1,024,829	1,496,100	2,128,950	2,378,051							
February	3,084,004	4,582,554	3,623,554	3,634,775	4,937,130							
March	3,753,464	3,562,962	4,512,986	4,481,568	4,658,107							
April	5,509,020	4,775,551	6,445,199	5,421,118	4,983,509							
May	9,530,268	7,306,952	7,005,488	6,614,258	8,672,144							
June	10,827,300	7,532,864	7,668,261	7,598,692	5,780,930							
July	11,314,996	10,465,968	7,933,818	12,035,376	12,228,373							
August	11,681,516	8,127,563	8,800,060	9,014,751	8,939,198							
September	11,947,804	10,720,305	9,812,920	10,646,248	11,471,347							
October	8,214,536	8,318,316	7,734,837	7,995,158	9,384,287							
November	7,372,288	5,705,377	5,442,812	6,555,910	6,124,285							
December	5,004,120	3,692,375	3,404,376	3,141,062	4,993,982							
Total	**89,241,636**	**75,815,616**	**73,880,411**	**79,267,866**	**84,551,343**	-	-	-	-	-	-	-

Water Costs

	2015	2016	2017	2018
$ of Potable Water per Unit	$0.90	$0.90	$0.90	
Unit (ccf, kgal, hcf etc)	HCF	HCF	HCF	
$ of Non-Potable Water per Unit	N/A	$0.00	N/A	
Unit (ccf, kgal, hcf etc)	N/A	0	N/A	
$ of Sewer per Unit	$3.30	$3.28	$3.32	
Unit (ccf, kgal, hcf etc)	HCF	HCF	HCF	
Drought Surcharge	0	0	0	

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