

DRAFT - MAY 2016

CITY OF MODESTO | MODESTO IRRIGATION DISTRICT

# Joint 2015 Urban Water Management Plan



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# Draft Joint 2015 Urban Water Management Plan

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Prepared for

**City of Modesto  
and  
Modesto Irrigation District**

**May 2016**



418-12-15-42

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## List of Acronyms and Abbreviations

|                 |   |
|-----------------|---|
| AB              | Assembly Bill   |
| AB 797          | Assembly Bill 797   |
| Act             | Urban Water Management Act  |
| AF              | Acre-Feet   |
| AFA             | Acre-Feet Annually  |
| ag              | Agriculture   |
| AMI             | Area Median Income  |
| AMR             | Automatic Meter Reading   |
| ARTDA           | Amended and Restated Treatment and Delivery Agreement                 |
| ASR             | Aquifer Storage and Recovery  |
| AWMP            | Agricultural Water Management Plan                                    |
| AWWA            | American Water Works Association                                      |
| Baseline GPCD   | Baseline Daily Per Capita Water Use                                   |
| BMP             | Best Management Practice  |
| CASGEM          | California Statewide Groundwater Elevation Monitoring Program         |
| cfs             | Cubic Feet Per Second   |
| CII             | Commercial Industrial and Institutional                               |
| CIMIS           | California Irrigation Management Information System                   |
| City            | City of Modesto   |
| CUWCC           | California Urban Water Conservation Council                           |
| CVP             | Central Valley Project  |
| CWC             | California Water Code   |
| CWP             | California Water Plan   |
| DBCP            | Dibromochloropropane  |
| DDW             | Department of Drinking Water  |
| DMC             | Delta-Mendota Canal   |
| DMMs            | Demand Management Measures  |
| DOF             | Department of Finance   |
| DPWD            | Del Puerto Water District   |
| DSS             | Digital Support System  |
| DWR             | Department of Water Resources   |
| DWR Guidebook   | 2015 Urban Water Management Plans Guidebook for Urban Water Suppliers |
| EOC             | Emergency Operations Center   |
| ESIRWM          | East Stanislaus Integrated Regional Water Management                  |
| ESRWMP          | East Stanislaus Regional Water Management Partnership                 |
| ET <sub>o</sub> | Reference Evapotranspiration  |
| EWMPs           | Efficient Water Management Practices                                  |
| FERC            | Federal Energy Regulatory Commission                                  |
| ft msl          | Feet Above Mean Sea Level   |
| GHGs            | Greenhouse Gases  |

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|         |   |
|---------|---|
| GIS     | Geographical Information System   |
| GPCD    | Gallons Per Capita Per Day  |
| GPS     | Global Positioning System   |
| GSA     | Groundwater Sustainability Agency                                       |
| GSP     | Groundwater Sustainability Plan   |
| HECW    | High Efficiency Clothes Washer  |
| M&I     | Municipal and Industrial  |
| MAF     | Million Acre-Feet   |
| MCL     | Maximum Contaminant Level   |
| MG      | Million Gallons   |
| mg/L    | Milligrams Per Liter  |
| MGD     | Million Gallons Per Day   |
| MID     | Modesto Irrigation District   |
| MOU     | Memorandum of Understanding   |
| MRWTP   | Modesto Regional Water Treatment Plant                                  |
| MSL     | Mean Sea Level  |
| MWEL    | Model Water Efficient Landscape Ordinance                               |
| NAICS   | North American Industry Classification System                           |
| NPDES   | National Pollutant Discharge Elimination System                         |
| NVRRWP  | North Valley Regional Recycled Water Program                            |
| PCE     | Perchloroethylene   |
| RMSs    | Resource Management Strategies  |
| RO      | Reverse Osmosis   |
| RUWMP   | Regional Urban Water Management Plan                                    |
| RWQCF   | Regional Water Quality Control Facility                                 |
| SB      | Senate Bill   |
| SB X7-7 | Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009 |
| SCADA   | Supervisory Control and Data Acquisition                                |
| SGMA    | Sustainable Groundwater Management Act                                  |
| SJRNR   | San Joaquin River National Wildlife Refuge                              |
| SOI     | Sphere of Influence   |
| sq mi   | Square Mile   |
| SSJID   | South San Joaquin Irrigation District                                   |
| TCE     | Trichloroethylene   |
| TDA     | Treatment and Delivery Agreement  |
| TDS     | Total Dissolved Solids  |
| TID     | Turlock Irrigation District   |
| TRPS    | Treated Water Pump Station  |
| USBR    | United States Bureau of Reclamation                                     |
| USFWS   | U.S. Fish and Wildlife Service  |
| USGS    | United States Geological Survey   |

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|           |                                      |
|-----------|--------------------------------------|
| UV        | Ultraviolet                          |
| UWMP      | Urban Water Management Plan          |
| WBIC      | Weather Based Irrigation Controllers |
| West Yost | West Yost Associates                 |
| WSCP      | Water Shortage Contingency Plan      |
| WSS       | WaterSense Specification             |

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## ES.1 INTRODUCTION

Over the last several years, Urban Water Management Plans (UWMPs) have assumed a very important role in water supply planning and management for communities in California. UWMPs have become the foundational documents which cities and water agencies use to develop water supply assessments and other key water supply reliability documents in support of providing water service to existing customers and future development in accordance with adopted General Plans and established Spheres of Influence.

With the current unprecedented water supply conditions in California, development of the 2015 UWMPs comes at a pivotal time. Current drought conditions have resulted in unprecedented State mandates for water conservation and have led to the passage of the Sustainable Groundwater Management Act of 2014. These actions will impact all water suppliers and all water users in the State. With the improving economy statewide, the need for reliable water supplies to serve existing customers, as well as new development, is more critical than ever. Also, 2015 is the first compliance year for the interim water use targets required by the Water Conservation Act of 2009 (SB X7-7).

The City of Modesto (City) and Modesto Irrigation District (MID) have prepared a Joint 2015 UWMP to provide a planning tool for the City and MID for developing and delivering municipal water supplies to the City's water service area. As described in this 2015 UWMP, the City of Modesto's (City's) residents and businesses have responded positively to the call for water conservation and both the City and MID continue to be committed to the implementation of good water management practices to ensure that adequate, reliable water supplies are available to meet existing and projected demands. The City has met its interim 2015 per capita water use target and is well positioned to meet the final 2020 water use target per capita water demand.

## ES.2 WATER CODE REQUIREMENTS

The Urban Water Management Planning Act (UWMP Act) requires water suppliers that provide over 3,000 acre-feet per year or have over 3,000 connections to prepare and submit to the State Department of Water Resources (DWR) an Urban Water Management Plan every 5 years.

The UWMP Act has been modified over the years in response to the State's water shortages, droughts and other factors. A significant amendment was made in 2009, after the 2007 to 2009 drought, and as a result of the Governor's call for a statewide 20 percent reduction in urban water use by the year 2020. This was the Water Conservation Act of 2009, also known as SB X7-7. This act required agencies to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020.

The primary objective of the UWMP Act is to direct "urban water suppliers" to develop an UWMP which provides a framework for long-term water supply planning and documents how urban water suppliers are carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future water demands.

## Executive Summary



In 2015, the City supplied approximately 47,459 acre-feet (AF) of water to approximately 74,686 residential and non-residential connections located within its water service area. The City is therefore considered an urban water supplier and is required to submit an UWMP. Although MID does not have any direct urban customers, the City has an exclusive dependence on MID's wholesale supplies. This is because MID delivers treated water exclusively to the City, and the City currently receives surface water supplies only from MID. This 2015 UWMP describes the City's and MID's water systems, historical and projected water use, water supply sources, and a comparison of projected water supply to water demands during normal, single-dry, and multiple-dry years in five-year increments from 2020 to 2040. As required by SB X7-7, this 2015 UWMP also confirms the City's 2015 and 2020 water use targets, verifies the City's compliance with the interim 2015 water use target, and describes the City's implementation plan for meeting the City's final 2020 water use target.

The City's and MID's Joint 2015 UWMP (or Plan) has been prepared in accordance with the UWMP Act, as defined by the California Water Code, Division 6, Part 2.6, Sections 10610 through 10656 (Urban Water Management Planning), and the Water Conservation Act of 2009 (WC Act, also known as SB X7-7), as defined by California Water Code, Division 6, Part 2.55, Section 10608 (Sustainable Water Use and Demand Reduction). A copy of the relevant sections of the Water Code are included in Appendix A of this document.

A brief summary of this 2015 UWMP's contents and the public review and adoption process is provided below, following a discussion of the legislative changes that have been enacted since the 2010 UWMP was prepared and adopted.

### ES.3 LEGISLATIVE CHANGES FROM 2010 UWMP

The legislative changes to the UWMP Act are described in Chapter 1. Some highlighted changes include:

- Demand Management Measures: Address the nature and extent of each water demand management measure implemented over the past 5 years in narrative form.
- 2015 UWMP Submittal Date to DWR: Changed from December 31, 2015 to July 1, 2016.
- Water Loss: Requires water suppliers to quantify and report on distribution system water loss using the AWWA Water Audit methodology.
- Voluntary Reporting of Passive Savings due to new water codes and requirements.
- Voluntary Reporting of Energy Intensity: Describe the water/energy nexus.
- Defining Water Features: Water Shortage Contingency Plans must distinguish between water features that are artificially supplied with water (including ponds, lakes, waterfalls, and fountains) and swimming pools and spas.

# Executive Summary



## ES.4 PLAN ORGANIZATION

This 2015 UWMP contains the appropriate sections and tables required per California Water Code Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of this 2015 UWMP, and has been prepared based on guidance provided by the California Department of Water Resources (DWR) in their January 2016 “2015 Urban Water Management Plans, Guidebook for Urban Water Suppliers” (DWR Guidebook).

DWR’s Urban Water Management Plan Checklist, as provided in the DWR Guidebook, has been completed to demonstrate the Plan’s compliance with applicable requirements. A copy of the completed checklist is included in Appendix C.

This 2015 Joint UWMP is organized into the following chapters:

- Chapter 1: Introduction and Overview
- Chapter 2: Plan Preparation
- Chapter 3: System Description
- Chapter 4: System Water Use
- Chapter 5: SB X7-7 Baselines and Targets
- Chapter 6: System Supplies
- Chapter 7: Water Supply Reliability Assessment
- Chapter 8: Water Shortage Contingency Planning
- Chapter 9: Demand Management Measures
- Chapter 10: Plan Adoption, Submittal and Implementation

Appendices (listed in Chapter 1) provide relevant supporting documents, including the 2015 UWMP tables and SB X7-7 Verification Form.

## ES.5 PLAN OVERVIEW

### ES.5.1 Service Area

The City’s service area consists of one large “contiguous” service area and several “outlying” non-contiguous service areas. The central contiguous service area is primarily defined by the City’s current sphere of influence (SOI) and includes Modesto, Salida, portions of North Ceres, and several unincorporated Stanislaus County “islands” located within the City’s SOI. These County islands include Empire, Bret Harte, Shackelford, and West Modesto, among several others.

## Executive Summary



The outlying service areas are not contiguous to the central service area and include Grayson, Del Rio, Ceres (Walnut Manor), and portions of Turlock.<sup>1</sup>

Although MID provides treated surface water to the City for urban delivery, MID is primarily an agricultural water supplier and does not directly serve any retail (municipal) water customers. The common City and MID water service area excludes those areas served by the City of Modesto with groundwater and/or which lie outside the MID water service boundary (these excluded areas generally include the communities of Del Rio, Grayson, parts of Ceres and Turlock, and parts of the City's service area located south of the Tuolumne River).

### ES.5.2 Water Supply

The City currently uses a conjunctive water use strategy with two primary water sources to meet potable water demands within the City's service area. These include:

- Surface water from the Tuolumne River via Modesto Reservoir and treated at MID's Modesto Regional Water Treatment Plant, which is purchased on a wholesale basis from MID; and
- Local groundwater pumped from City wells located throughout the City's service area.

City residents within the contiguous service area north of the Tuolumne River (including North Modesto, Salida, and Empire) generally rely on treated surface water supply from MID year-round, supplemented with groundwater as needed. Water demands for the contiguous service area located south of the Tuolumne River (South Modesto) and the City's outlying service areas (Del Rio, Grayson, and parts of Ceres and Turlock) are met entirely with groundwater supply year-round.

### ES.5.3 SB X7-7 Baselines and Targets

As part of the City's compliance with SB X7-7, the City has established its baseline per capita water use, interim (2015) per capita water use target, and final (2020) per capita water use target. The development of the City's baseline and per capita water use are described in Chapter 5 and Appendix F and are summarized as follows:

- Base Daily Per Capita Water Use (10-year): 285 gallons per capita per day (GPCD);
- 2015 Interim Per Capita Water Use Target: 257 GPCD, and
- 2020 Final Per Capita Water Use Target: 228 GPCD.

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<sup>1</sup> Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford. The water supplies for Waterford and Hickman are now managed by the City of Waterford. The City of Waterford also owns and operates these two water systems.

## Executive Summary



The City has calculated its actual 2015 water use for the 2015 calendar year as 163 GPCD, which is well below the 2015 interim water use target of 257 GPCD. Therefore, the City has met its interim 2015 water use target.

### ES.5.4 Water Supply Availability and Reliability

The City relies on two primary water sources: Tuolumne River surface water deliveries (purchased wholesale from MID) and groundwater. The future water supply for the City will continue to be a mix of groundwater and surface water supply.

The City's Normal Year demands have been projected based on remaining vacant land assumed to be developed by buildout (estimated at 2050) in the City's service area (additional details are in the City's Water Master Plan (2016)). MID's wholesale water demand is projected to match the available supply as the City plans to maximize the use of treated surface water supply.

As described in Chapter 7, based on the anticipated availability and reliability of the City and MID water supplies during normal, single dry, and multiple dry years, the City anticipates that with water conservation in dry years it has adequate water supplies to meet projected water demands during all hydrologic conditions through 2040. The need for future water conservation during dry periods is consistent with the City's response to recent drought conditions, where the City's water customers have significantly reduced their water use in accordance with the City's Drought Contingency Plan.

### ES.5.5 Drought Contingency Plan

In response to the recent State mandates for water conservation, the City adopted a revised Drought Contingency Plan (to include an additional Stage IIA drought condition) and to also declare a more severe Stage II drought condition. The City's revised Drought Contingency Plan was approved, and the City entered into a Stage II drought condition on May 1, 2015. On November 24, 2015, City Council approved enacting a Stage IIA drought condition, effective December 1, 2015. On April 26, 2016, City Council approved reinstating Drought Stage II requirements, effective May 1, 2016 through October 31, 2016.

The City's 2015 Drought Contingency Plan delineates four stages of action, prohibitions and other water consumption reduction methods, and associated penalties and charges for violating the established water use restrictions. The four stages of action specify reduction objectives ranging from 10 to 50 percent of normal water demand, depending on the water shortage stage declared. The City's Drought Contingency Plan is further described in Chapter 8 of this 2015 UWMP.

### ES.5.6 Demand Management

The City's compliance with the established SB X7-7 targets will be achieved through the implementation of the City's Water Conservation Plan. As described in Chapter 9, the City has implemented, or plans to implement, all of the Best Management Practices (BMPs), as defined in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU). MID has also instituted a water conservation program which includes limiting water

## Executive Summary



losses through the water conveyance systems, agricultural conservation programs and public information, etc. as reposed in its 2015 Agricultural Water Management Plan (AWMP).

### ES.6 PLAN REVIEW AND ADOPTION

The UWMP Act requires the water supplier to coordinate the preparation of its Plan with other appropriate agencies, including other water suppliers that share a common source, water management agencies, and relevant public agencies. These agencies, as well as the public, participated in the coordination and preparation of this Joint 2015 UWMP. The coordination and outreach are described in Chapter 2.

Public hearings to discuss the Joint 2015 Draft UWMP were held by both the City of Modesto and MID on June 14, 2016.

Public hearings provide an opportunity for all City and MID water users and the general public to become familiar with the Plan and to ask questions about water supply and continuing plans for providing a reliable, safe, high-quality water supply. The adoption, implementation and economic impact of revised per capita water use targets (described in Chapter 5) was also discussed. Copies of the draft Plan were made available for public inspection at the City's Utilities Department and at the MID Board Secretary's office, with an electronic version placed on the City and MID websites.

Water Code §10621(b) requires agencies to notify the cities and counties to which they serve water that the Plan is being updated and reviewed. This notification must be sent out at least 60 days in advance of the public hearing. In early 2016, a notice of preparation was sent to the cities and counties, and other stakeholders, to inform them of the UWMP update process and schedule and to solicit input for the Plan update. The notifications to cities and counties, the public hearing notifications, and the public hearing and adoption are discussed in Chapter 10 and provided in Appendix D.

This Plan was adopted by the City Council and by the MID Board of Directors at their respective meetings on \_\_\_\_\_. Copies of the City and MID adoption resolutions are provided in Appendix K.

Within 30 days of Plan adoption, a copy of the Plan was submitted to DWR, the California State Library and the cities and counties to which the urban water supplier provides water.

Within 30 days of submitting the adopted Plan to DWR, copies of this Plan will be made available during normal business hours at the following locations:

- City of Modesto, Utilities Department, 1010 Tenth Street, 4<sup>th</sup> Floor, Modesto; and
- MID Secretary Office, 1231 Eleventh Street, Modesto.

## Executive Summary

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Copies of the adopted 2015 UWMP will also be available on the City and MID websites:

- City of Modesto Utilities Department Website (<http://www.modestogov.com/uppd/reports/>)
- MID website (<http://www.mid.org/water/uwmp>)

Should this Plan be amended or changed, copies of amendments or changes to the Plan shall be submitted to DWR, the California State Library, and any city or county within which the City provides water supplies within 30 days after adoption of the amendment(s),

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# CHAPTER 1

## Introduction and Overview



This chapter provides an introduction and overview of the City of Modesto (City) and Modesto Irrigation District (MID) Joint 2015 Urban Water Management Plan (UWMP) including the importance and extent of the City's and MID's water management planning efforts, changes since the preparation of the Joint 2010 UWMP, and organization of this 2015 UWMP. This 2015 UWMP has been prepared by City staff, MID staff, and West Yost Associates (West Yost).

### 1.1 INTRODUCTION

The Urban Water Management Planning Act (Act) was originally established by Assembly Bill 797 (AB 797) on September 21, 1983. Passage of the Act was recognition by state legislators that water is a limited resource and a declaration that efficient water use and conservation would be actively pursued throughout the State. The primary objective of the Act is to direct "urban water suppliers" to develop an UWMP which provides a framework for long-term water supply planning and documents how urban water suppliers are carrying out their long-term water resource planning responsibilities to ensure adequate water supplies are available to meet existing and future water demands. A copy of the current version of the Act, as incorporated in Sections 10610 through 10656 of the California Water Code (CWC), is provided in Appendix A of this report.

### 1.2 IMPORTANCE AND EXTENT OF JOINT WATER MANAGEMENT PLANNING EFFORTS

The purpose of the UWMP is to provide a planning tool for the City and MID for developing, managing, and delivering municipal water supplies to the City's water service area. The City and MID have had a long history of providing a clean and reliable water supply to their customers. To continue to meet the water needs of the community, the City and MID carefully manage their available water resources. This 2015 UWMP is a comprehensive guide to assist both agencies in effectively utilizing available supplies to maximize existing and available resources.

It should be noted that MID is primarily an agricultural water supplier and has also prepared a 2015 Agricultural Water Management Plan (AWMP) Update<sup>1</sup> in accordance with the requirements of the Water Conservation Act of 2009 (SB X7-7).

### 1.3 CHANGES FROM 2010 UWMP

The Urban Water Management Planning Act has been modified over the years in response to the State's water shortages, droughts and other factors. A significant amendment was made in 2009, after the 2007 to 2009 drought, as a result of the Governor's call for a statewide 20 percent reduction in urban water use by the year 2020. This was the Water Conservation Act of 2009, also known as Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009 (SB X7-7). This act required agencies to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020.

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<sup>1</sup> Modesto Irrigation District 2015 Agricultural Water Management Plan Update, prepared by Provost & Pritchard, December 2015.

There have been several additions and changes to the California Water Code since the Joint 2010 UWMP was prepared. These are summarized below:

- AB 2067 (Weber 2014)
  - CWC Section 10631(f)(1) and (2): Demand Management Measures
    - Requires water suppliers to provide narratives describing their water demand management measures, as provided.
    - Requires retail water suppliers to address the nature and extent of each water demand management measure implemented over the past 5 years and describe the water demand management measures that the supplier plans to implement to achieve its water use targets.
    - See Chapter 9 of this 2015 UWMP for a description of the City's Demand Management Measures.
  - CWC Section 20621(d): Submittal Date
    - Requires each urban water supplier to submit its 2015 UWMP to the California Department of Water Resources (DWR) by July 1, 2016.
- Senate Bill (SB) 1420 (Wolk 2014)
  - CWC Section 10644(a)(2): Submittal Format
    - Requires the plan, or amendments to the plan, to be submitted electronically to DWR.
  - CWC Section 10644(a)(2): Standardized Forms
    - Requires the plan, or amendments to the plan, to include any standardized forms, tables, or displays specified by DWR.
  - CWC 10631(e)(1)(J) and (e)(3)(A) and (B): Water Loss
    - Requires a plan to quantify and report on distribution system water loss.
    - See Chapter 4 of this 2015 UWMP for a description of the City's and MID's distribution system water losses.
  - CWC 10631(e)(4): Voluntary Reporting of Passive Savings
    - Provides for water use projections to display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans, when that information is available and applicable to an urban water supplier.
    - The City and MID have opted not to report on passive water savings in this 2015 UWMP.
- SB 1036 (Pavley 2014)
  - CWC 10631.2(a) and (b): Voluntary Reporting of Energy Intensity
    - Provides for an urban water supplier to include certain energy-related information, including, but not limited to, an estimate of the amount of the energy used to extract or divert water supplies.
    - The City and MID have opted not to report on energy intensity in this 2015 UWMP.

- CWC 10632: Defining Water Features
  - Commencing with the UWMP update due July 1, 2016, for purposes of developing the water shortage contingency analysis, requires urban water suppliers to analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.
  - See Chapter 8 of this 2015 UWMP for a discussion of the City’s water shortage contingency planning.

### 1.4 PLAN ORGANIZATION

This 2015 UWMP contains the appropriate sections and tables required per CWC Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of this 2015 UWMP, and has been prepared based on guidance provided by DWR in their “2015 Urban Water Management Plans Guidebook for Urban Water Suppliers” (DWR Guidebook).

Where applicable, separate descriptions have been prepared for the City and MID. Throughout this document, the City and MID sections reference each other extensively. This is because MID delivers treated water supplies exclusively to the City, and the City currently receives surface water supplies only from MID. Because this relationship is currently exclusive, much of the retail-wholesale information is interchangeable between these agencies. In addition, because MID does not have any direct urban customers, the City oversees demand management measures and other public outreach activities.

It should be noted that the primary basis for the general information and specific data reported in this 2015 UWMP is from the City’s Water Master Plan, which is currently being updated (the City’s Water Master Plan is expected to be completed by the end of 2016).

This 2015 UWMP is organized into the following chapters:

- Chapter 1: Introduction and Overview
- Chapter 2: Plan Preparation
- Chapter 3: System Description
- Chapter 4: System Water Use
- Chapter 5: SB X7-7 Baselines and Targets
- Chapter 6: System Supplies
- Chapter 7: Water Supply Reliability Assessment
- Chapter 8: Water Shortage Contingency Planning
- Chapter 9: Demand Management Measures
- Chapter 10: Plan Adoption, Submittal and Implementation

This 2015 UWMP also contains the following appendices of supplemental information and data:

- Appendix A: Legislative Requirements
- Appendix B: DWR 2015 UWMP Tables
- Appendix C: DWR 2015 UWMP Checklist
- Appendix D: Required Notices
- Appendix E: Water Audit
- Appendix F: SB X7-7 Verification Forms
- Appendix G: MID Supply Reliability Information
- Appendix H: Groundwater Information
- Appendix I: Water Shortage Contingency Plan
- Appendix J: Water Conservation Program Information
- Appendix K: UWMP Adoption Resolution

Furthermore, this 2015 UWMP contains all of the tables recommended in the DWR Guidebook, both embedded into the UWMP chapters where appropriate and included in Appendix B.

DWR's Urban Water Management Plan Checklist, as provided in the DWR Guidebook, has been completed by West Yost to demonstrate this plan's compliance with applicable requirements. A copy of the completed checklist is included in Appendix C.

## CHAPTER 2 Plan Preparation



This chapter describes the preparation of the City of Modesto/MID Joint 2015 UWMP, including the basis for the preparation of the plan, individual or regional planning, fiscal or calendar year reporting, units of measure, and plan coordination and outreach.

### 2.1 BASIS FOR PREPARING A PLAN

The Urban Water Management Planning Act requires every “urban water supplier” to prepare and adopt an UWMP, to periodically review its UWMP at least once every five years and make any amendments or changes which are identified by the review. An “urban water supplier” is defined as a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually.

As shown in Table 2-1, in 2015, the City provided water supplies to 74,686 customers (connections), and supplied 47,459 AF of water. Therefore, the City is required to prepare an UWMP. The City and MID’s last UWMP, the Joint 2010 UWMP, was adopted by both the Modesto City Council and MID Board of Directors in May 2011.

**Table 2-1. Retail: Public Water Systems<sup>(a,b)</sup> (DWR Table 2-1 Retail)**

| Public Water System Number | Public Water System Name | Number of Municipal Connections 2015 | Volume of Water Supplied 2015 |
|----------------------------|--------------------------|--------------------------------------|-------------------------------|
| CA5010010 <sup>(c)</sup>   | City of Modesto          | 69,152                               | 45,544                        |
| CA5010005 <sup>(d)</sup>   | Salida                   | 4,399                                | 909                           |
| CA5010031                  | Ceres (Walnut Manor)     | 53                                   | 44                            |
| CA5010033                  | Grayson                  | 274                                  | 162                           |
| CA5010029                  | Del Rio (Hillcrest)      | 389                                  | 577                           |
| CA5010034                  | North Turlock            | 52                                   | 31                            |
| CA5010023                  | South Turlock            | 332                                  | 192                           |
| CA5010035 <sup>(e)</sup>   | Central Turlock          | 35                                   | 0                             |
| <b>TOTAL</b>               |                          | <b>74,686</b>                        | <b>47,459</b>                 |

**NOTES:**

- (a) Represents available services (includes billed and unbilled accounts).
- (b) Represents water production (AF).
- (c) Includes Empire and North Ceres services that are contiguous to the City of Modesto water system (interconnected).
- (d) Salida is contiguous to the City of Modesto water system (interconnected).
- (e) No SCADA available for production because City of Turlock provides groundwater to this system via an interconnection with Turlock.

As of July 1, 2015, water utility customers in Waterford and Hickman are no longer being served by the City of Modesto.<sup>1</sup> To accurately project water demands for the City’s water service area, the historical water use and populations from the Waterford and Hickman service areas are not included in this 2015 UWMP.

**2.2 REGIONAL PLANNING**

As described in Section 2.3 below, the City and MID have prepared this Joint 2015 UWMP on an individual reporting basis, not part of a regional planning process. However, the City and MID coordinate routinely with each other to ensure that a safe and reliable water supply is delivered to existing customers and that plans for serving future customers are implemented as efficiently as possible.

**2.3 INDIVIDUAL OR REGIONAL PLANNING AND COMPLIANCE**

This 2015 UWMP has been prepared on an Individual Reporting basis, covering only the City and MID’s municipal water service area (see Table 2-2). As described below in Section 2.5, the City and MID have notified and coordinated with appropriate regional agencies and constituents.

**Table 2-2. Plan Identification (DWR Table 2-2)**

| Select Only One                     | Type of Plan                                 | Name of RUWMP or Regional Alliance<br><i>if applicable</i> |
|-------------------------------------|--|--|
| <input checked="" type="checkbox"/> | Individual UWMP                              |  |
| <input type="checkbox"/>            | Regional Urban Water Management Plan (RUWMP) |  |

**2.4 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE**

The City is a water retailer and MID is the City’s water wholesaler.

This Joint 2015 UWMP has been prepared on a calendar year basis. Water use and planning data for the entire calendar year of 2015 has been included.

The City and MID’s reporting of water volumes in this 2015 UWMP is in AF.

Table 2-3 summarizes the City and MID’s reporting methods for this 2015 UWMP.

<sup>1</sup> The water supplies for Waterford and Hickman are now managed by the City of Waterford. The City of Waterford also owns and operates these two water systems.

**Table 2-3. Agency Identification (DWR Table 2-3)**

| Type of Agency (select one or both)                   |                                   |
|---|-----------------------------------|
| <input checked="" type="checkbox"/>                   | Agency is a wholesaler            |
| <input checked="" type="checkbox"/>                   | Agency is a retailer              |
| Fiscal or Calendar Year (select one)                  |                                   |
| <input checked="" type="checkbox"/>                   | UWMP Tables Are in Calendar Years |
| <input type="checkbox"/>                              | UWMP Tables Are in Fiscal Years   |
| Units of Measure Used in UWMP (select from Drop down) |                                   |
| Unit  | AF                                |

## 2.5 COORDINATION AND OUTREACH

This section includes a discussion of the City and MID’s inter-agency coordination and coordination with the general public. The Urban Water Management Planning Act requires the City and MID to coordinate the preparation of their Plan with other appropriate agencies and all departments within the City, including other water suppliers that share a common source, water management agencies, and relevant public agencies. Neighboring water agencies, as well as the public, participated in the coordination and preparation of this 2015 UWMP, and are summarized below.

### 2.5.1 Wholesale and Retail Coordination

*Water Code §10631*

*(j) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier’s plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).*

The City is the primary domestic water purveyor in Stanislaus County, serving not only the City of Modesto but also the communities of Del Rio, Empire, Salida, Grayson, and parts of Ceres and Turlock. As discussed above, as of July 1, 2015, the City no longer provides water service to the communities of Waterford and Hickman.

In accordance with CWC 10631, the City and MID have informed each other of projected water use for the period from 2020 to 2040, as summarized in Tables 2-4 and 2-5.

**Table 2-4. Retail: Water Supplier Information Exchange (DWR Table 2-4 Retail)**

|   |
|---|
| The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631. |
| Wholesale Water Supplier Name   |
| Modesto Irrigation District (MID)   |

**Table 2-5. Wholesale: Water Supplier Information Exchange (DWR Table 2-4 Wholesale)**

|                                     |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631.<br><b>Complete the table below.</b> |
| Water Supplier Name                 |   |
| City of Modesto                     |   |

### 2.5.2 Coordination with Other Agencies and the Community

The City and MID coordinated the preparation of this 2015 UWMP with other local agencies and the community.

#### 2.5.2.1 Coordination with Other Agencies

*Water Code §10620 (d)(2)*

*(d)(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

The City and MID coordinated the preparation of this 2015 UWMP with other agencies as discussed further in Chapter 10.

#### 2.5.2.2 Coordination with the Community

*Water Code §10642*

*Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*



The City and MID have both actively encouraged community participation in water management activities and specific water-related projects, such as preparation of the recurring UWMPs, Groundwater Management Plans, and Urban Area General Plan, as well as implementation of water conservation programs. Public participation has also been encouraged for specific regional water supply projects including the Modesto Regional Water Treatment Plant (MRWTP) Phase Two project.

The City's public participation program includes both active and passive means of obtaining input from the community, such as mailings, public meetings, and web-based communication. The City's website describes major multi-year water projects for extending water lines and installing wells and updating and rebuilding existing facilities. The website also posts announcements of planned rate increases to fund these water projects.

MID provides educational videos on water to classrooms within the District free of charge. MID's website solicits public comment on water projects, as well as providing public information.

As part of development of this 2015 UWMP, the City and MID allowed a public review period, following noticing and prior to adoption, to allow ample time for public comments to be developed and received. Public noticing, pursuant to Section 6066 of the Government Code, was conducted prior to commencement of the public comment period. Public hearing notices are included in Appendix D of this document. During the public comment period, the Draft UWMP update was made available at the City's Utilities Department and at the MID Board Secretary's Office, as well as on the City and MID websites.

### 2.5.3 Notice to Cities and Counties

#### *Water Code §10621(b)*

*Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.*

Water Code §10621(b) requires agencies to notify the cities and counties to which they serve water at least 60 days in advance of the public hearing that the plan is being updated and reviewed. In early 2016, a notice of preparation was sent to the cities and counties served by the City and MID, and other stakeholders, to inform them of the UWMP update process and schedule and to solicit input for the Plan update. The notifications to cities and counties, the public hearing notifications, and the public hearing and adoption are discussed in Chapter 10.

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This chapter provides a description of the City and MID water service areas. This includes a description of the water system facilities, climate, and population associated with municipal water use.

### 3.1 GENERAL DESCRIPTION

The City and MID are located in the heart of the San Joaquin Valley, approximately 90 miles southeast of the San Francisco Bay Area and 77 miles south of the City of Sacramento as shown on Figure 3-1. Both the City and MID service areas are located in Stanislaus County. The City of Modesto is the largest incorporated city in Stanislaus County and accounts for approximately 40 percent of the County's population.

### 3.2 SERVICE AREA DESCRIPTION

The following sections provide brief descriptions of the geographical boundaries, water supplies and water system facilities for the City and MID service areas.

#### 3.2.1 Geographical Boundaries

The City and MID's jurisdictional boundaries are shown on Figures 3-2 and 3-3, respectively.

##### 3.2.1.1 City Service Area

The City's service area consists of one large "contiguous" service area and several "outlying" non-contiguous service areas. The central contiguous service area is primarily defined by the City's current sphere of influence (SOI) and includes Modesto, Salida, portions of North Ceres, and several unincorporated Stanislaus County "islands" located within the City's SOI. These County islands include Empire, Bret Harte, Shackelford, and West Modesto, among several others. The outlying service areas are not contiguous to the central service area and include Grayson, Del Rio, Ceres (Walnut Manor), and portions of Turlock.<sup>1</sup>

##### 3.2.1.2 MID Service Area

MID is primarily an agricultural water supplier. Although treated water is provided to the City for urban delivery, MID does not directly serve any retail (municipal) water customers. The place of use for MID treated water is defined by the overlap of the MID water service area boundary with the City's service area north of the Tuolumne River. The common City and MID water service area excludes those areas served by the City of Modesto with groundwater and/or which lie outside the MID water service boundary; these excluded areas generally include the communities of Del Rio, Grayson, parts of Ceres and Turlock, and parts of the City's service area located south of the Tuolumne River.

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<sup>1</sup> Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford. The water supplies for Hickman and Waterford are now managed by the City of Waterford. The City of Waterford also owns and operates these two water systems.

### 3.2.2 Water Supply Overview

The City has been providing potable water service to its urban area since 1895 through the purchase and acquisition of several private water companies. Until 1995, the sole source of water supply to the City was groundwater pumped from the San Joaquin Valley Groundwater Basin. In the early 1990s, the City, MID and the former Del Este Water Company formed a partnership to use a portion of MID's surface water supplies for municipal water use. This shift to surface water supply has allowed the City to stabilize groundwater pumping rates to allow for groundwater aquifer recovery.

MID was formed as the second irrigation district in California in 1887. Since that time, MID has developed numerous water rights and facilities to provide agricultural irrigation water from the Tuolumne River. MID has also developed groundwater supplies for agricultural uses. For the current and projected planning timeframe in this 2015 UWMP, it is assumed that MID would only provide wholesale treated surface water to the City for municipal use.

### 3.2.3 Water System Facilities

This section describes water facilities to supply and deliver urban water supplies to the City's service area. As described above, MID is primarily an agricultural water supplier and operates extensive facilities to deliver agricultural water supplies. These facilities, although not described below, include a complex network of canals, pipelines, pumps, drainage features, and control structures.

#### 3.2.3.1 Surface Water Supply

The City, MID, and the former Del Este Water Company formed the Modesto Domestic Water Partnership in the early 1990s (in 1995, the City acquired the Del Este Water Company) to use a portion of MID's surface water rights for municipal uses, and entered into a Treatment and Delivery Agreement (TDA) to cover the design, construction, commercial operation (i.e., governing delivery of treated surface water from MID to the City), and financing for the Initial Phase (Phase One) of the MRWTP. This new surface water treatment plant, along with associated storage and delivery facilities, became operational in 1995, and the City has purchased wholesale treated surface water from MID since.

The MRWTP is owned and operated by MID and per the original TDA, delivers an annual average supply of 30 million gallons per day (MGD) (33,600 acre-feet per year (AFA)) to the City with a functional hydraulic peaking capacity up to 42.5 MGD. This treated surface water supply from MID, coupled with the available groundwater supply (together termed a "conjunctive supply") is used to meet the City's water supply needs for municipal customers in the contiguous service area located north of the Tuolumne River (this is the southern boundary of the MID service area).

The MRWTP Phase Two Expansion project was essentially completed in May 2016, and will provide the City with up to an additional 30 MGD of treated surface water supply for a total annual average supply of up to 60 MGD (67,200 AFA) by 2050.<sup>2</sup> The peaking capacity for the Phase Two Expansion will be determined after start-up operations and testing protocols are completed. It should be noted that the total 60 MGD capacity is based on a normal and wet year annual average. The delivery of Phase Two treated surface water is governed by the October 2005 Amended and Restated TDA (ARTDA), and the ARTDA includes formulas to determine supply reductions during dry years.

#### 3.2.3.2 Groundwater Supply

The City's groundwater supply wells are located throughout the contiguous and outlying service areas, and these wells are located within the San Joaquin Valley Groundwater Basin (Modesto, Turlock and Delta-Mendota subbasins). The residents within the contiguous service area north of the Tuolumne River (North Modesto, Salida, and Empire) generally rely on treated surface water supply from MID year-round, and are supplemented with groundwater to meet increased water demands (primarily in the summer months). Water demands from the contiguous service area located south of the Tuolumne River (South Modesto) and the outlying service areas are met with groundwater supply year-round. The City currently has approximately 86 active groundwater wells in both the contiguous and outlying service areas that have the capacity to supply approximately 125 MGD of groundwater to the City's service area.

#### 3.2.3.3 Distribution System

The major water distribution system facilities in the City's contiguous and outlying service areas are shown on Figure 3-4.

The City's contiguous service area consists of approximately 900 miles of transmission and distribution pipelines. A portion of the transmission mains traversing the City is owned and operated by MID, and these transmission mains provide treated surface water through a series of turnouts that have the ability to control water supply into the City's water distribution system. The contiguous system currently has 77 active groundwater wells. The contiguous water system also has eight at-grade storage tanks with a combined total storage capacity of 12.1 million gallons (MG). Each storage tank has a booster pump station to pump water from the tank into the distribution system. There are also two 5.0 MG MRWTP reservoirs (10.0 MG total) that are owned and operated by MID.

The City's outlying service areas are served by groundwater wells located in each of the outlying service areas. Only the Grayson service area has an at-grade storage tank and booster pump station. The other outlying service areas are served exclusively from the existing groundwater wells.

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<sup>2</sup> The actual supply available depends on the amount of agricultural land converted to urban uses. An additional 10 MGD is assumed to be available by 2020, gradually increasing to an additional 30 MGD by 2050 (buildout).

### 3.3 SERVICE AREA CLIMATE

The climate of the City and MID service areas is best described as Mediterranean, characterized by hot, dry summers and cool winters. Precipitation in the area averages about 12.2 inches per year.

Water use within the City’s service area is dependent on various climate factors such as temperature, precipitation, and evapotranspiration (ET<sub>o</sub>). Climate data, including temperature and precipitation estimates, were obtained for Modesto, California. The period of record was March 1, 1906 to January 20, 2015. ET<sub>o</sub> describes water lost through evaporation from the soil and surface-water bodies combined with plant transpiration. In general, the reference ET<sub>o</sub> is given for turf grass, and then corrected for a specific crop type. Local ET<sub>o</sub> data was obtained from California Irrigation Management Information System (CIMIS) monitoring station in West Modesto (Station #71).

The historical climate characteristics affecting water management in the City and MID service areas are shown in Table 3-1.

**Table 3-1. Monthly Average Climate Data Summary**

| Month        | Standard Monthly Average ET <sub>o</sub> , inches <sup>(a)</sup> | Average Total Rainfall, inches <sup>(b)</sup> | Average Temperature, degrees Fahrenheit <sup>(b)</sup> |             |
|--------------|--|---|--|-------------|
|              |  |   | Maximum  | Minimum     |
| January      | 1.10   | 2.44  | 53.8   | 37.6        |
| February     | 1.88   | 2.07  | 60.9   | 40.8        |
| March        | 3.57   | 1.93  | 66.9   | 43.5        |
| April        | 5.23   | 1.03  | 73.3   | 46.8        |
| May          | 6.98   | 0.46  | 81.2   | 51.8        |
| June         | 7.87   | 0.13  | 88.3   | 56.6        |
| July         | 7.95   | 0.02  | 94.3   | 60.0        |
| August       | 6.89   | 0.04  | 92.3   | 58.8        |
| September    | 5.10   | 0.17  | 87.7   | 56.0        |
| October      | 3.40   | 0.63  | 77.9   | 49.6        |
| November     | 1.70   | 1.24  | 64.6   | 41.7        |
| December     | 1.05   | 2.05  | 54.4   | 37.7        |
| <b>Total</b> | <b>52.7</b>  | <b>12.2</b>                                   | <b>74.6</b>  | <b>48.4</b> |

<sup>(a)</sup> Source: California Irrigation Management Information System (CIMIS) data for Station #71: Modesto (downloaded January 28, 2016).  
<sup>(b)</sup> Source: Western Regional Climate Center data for DWR for Modesto, California (period of record: March 1, 1906 to January 20, 2015).

### 3.4 SERVICE AREA POPULATION AND DEMOGRAPHICS

#### 3.4.1 City of Modesto Population

The City has historically been among the fastest growing areas in California. The City's population grew steadily from 1996 through 2004 (at an average rate of 1.8 percent per year). However, since 2005, growth within the City's service area has slowed significantly as a result of the national and statewide economic downturn. Growth from 2010 to 2015 has remained relatively stable and was equal to only 3.2 percent for the five-year period, or about 0.6 percent per year.<sup>3</sup>

Historical population estimates for the City's water service area are based on Census data from California Department of Finance (DOF) Report E-4, with the 2010 Census Benchmark, where available. Where DOF data are not available (e.g., Turlock and Ceres (Walnut Manor) areas), the population has been estimated based on a count of existing dwelling units served by the City (from aerial photographs), and an estimated housing density (people per dwelling unit) based on Census data for the surrounding communities.

Based on data from the City's Community and Economic Development Department, it is assumed that future growth in a significant portion of the contiguous service area will be at an annual rate of approximately 1.3 percent (based on the San Joaquin Valley Demographic Forecast 2010 to 2050). The projected population for the City's contiguous and outlying service areas at buildout (estimated to be at 2050) is anticipated to be roughly 393,600 people and represents about a 50 percent increase from the current (2015) population. The growth assumptions used to project the population for each portion of the City's water service area are summarized below:

- City of Modesto: Assume a 1.3 percent annual growth rate from 2015 through 2050
- Salida: Assume a 1.3 percent annual growth rate from 2015 through 2050
- Communities of Empire, North Ceres (Bystrom), Bret Harte, Shackelford, and West Modesto: Fully developed; no additional growth anticipated
- Del Rio: Estimated based on projected demand and historical per capita water use; equates to a 2.6 percent average annual growth rate
- Grayson: Estimated based on projected demand and historical per capita water use; equates to a 0.7 percent average annual growth rate
- Turlock: Fully developed; no additional growth anticipated
- Ceres (Walnut Manor): Fully developed; no additional growth anticipated

Table 3-2 summarizes the current and projected population for the City's contiguous and outlying service areas.

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<sup>3</sup> Excludes population from the communities of Hickman and Waterford.

**Table 3-2. Retail: Population – Current and Projected (DWR Table 3-1 Retail)**

| Population Served | 2015    | 2020    | 2025    | 2030    | 2035    | 2040(opt) |
|-------------------|---------|---------|---------|---------|---------|-----------|
|                   | 259,187 | 274,920 | 291,686 | 309,555 | 328,599 | 348,896   |

NOTES: 2015 population from California Department of Finance where available and projected populations are based on the City of Modesto Water Master Plan (refer to Table 3-1 in the Water Master Plan). Does not include population from Hickman and Waterford.

### 3.4.2 MID Population

As stated previously, MID does not directly serve any municipal water customers, and does not plan to do so in the future, as summarized in Table 3-3.

**Table 3-3. Wholesale: Population – Current and Projected (DWR Table 3-1 Wholesale)**

| Population Served | 2015 | 2020 | 2025 | 2030 | 2035 | 2040(opt) |
|-------------------|------|------|------|------|------|-----------|
|                   | 0    | 0    | 0    | 0    | 0    | 0         |

NOTES: MID does not directly serve any urban water customers. The population served by MID wholesale water is included the City's total service area population (see DWR Table 3-1 Retail).

### 3.4.3 Other Demographic Factors

No other demographic factors affecting water use in the City and MID service areas have been identified at this time. If additional demographic factors are identified, these will be addressed in subsequent updates to this 2015 UWMP.





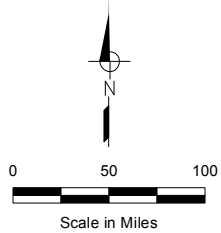
DRAFT

**LEGEND**

- Modesto
- Stanislaus County
- California Counties

**FIGURE 3-1**

**City of Modesto / MID  
2015 UWMP**



**MODESTO VICINITY MAP**

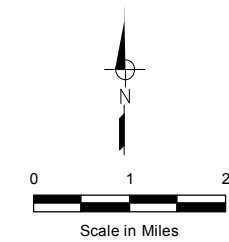
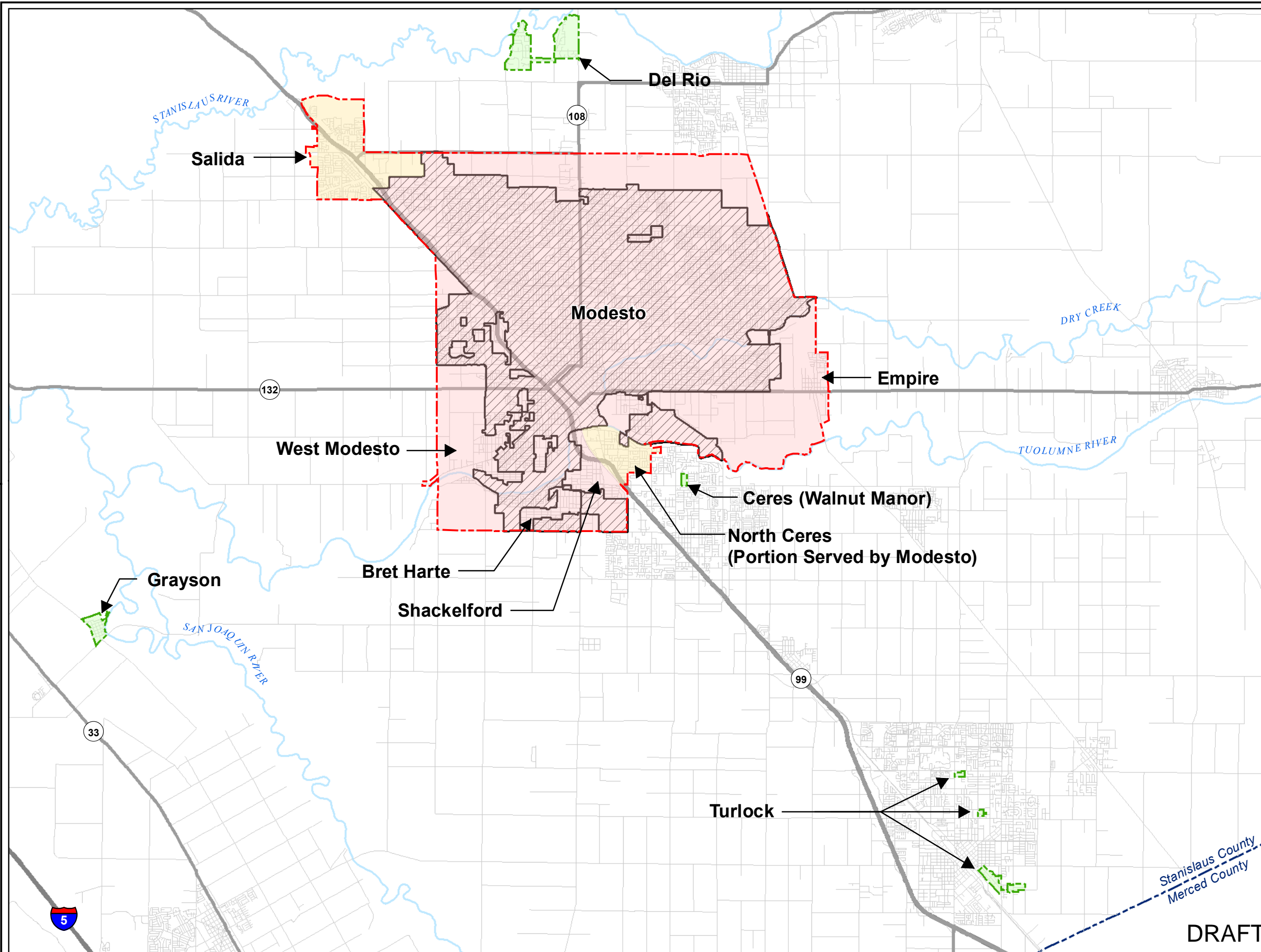


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**FIGURE 3-2**

**City of Modesto / MID  
2015 UWMP**

**CITY OF MODESTO  
WATER SERVICE AREAS**



- Notes**
1. Sphere of influence boundary obtained from the City on 11/6/2014.
  2. The City's contiguous service area is co-terminus with the City's SOI boundary except for the Salida and North Ceres areas.
  3. Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford.

**LEGEND**

- Sphere of Influence (SOI)
- Contiguous Service Area
- Contiguous Area Outside of SOI
- Outlying Service
- City Limits

Stanislaus County  
Merced County

**DRAFT**

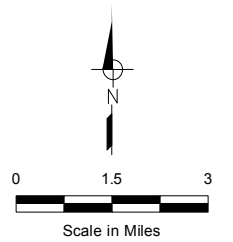


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**FIGURE 3-3**

**City of Modesto / MID  
2015 UWMP**

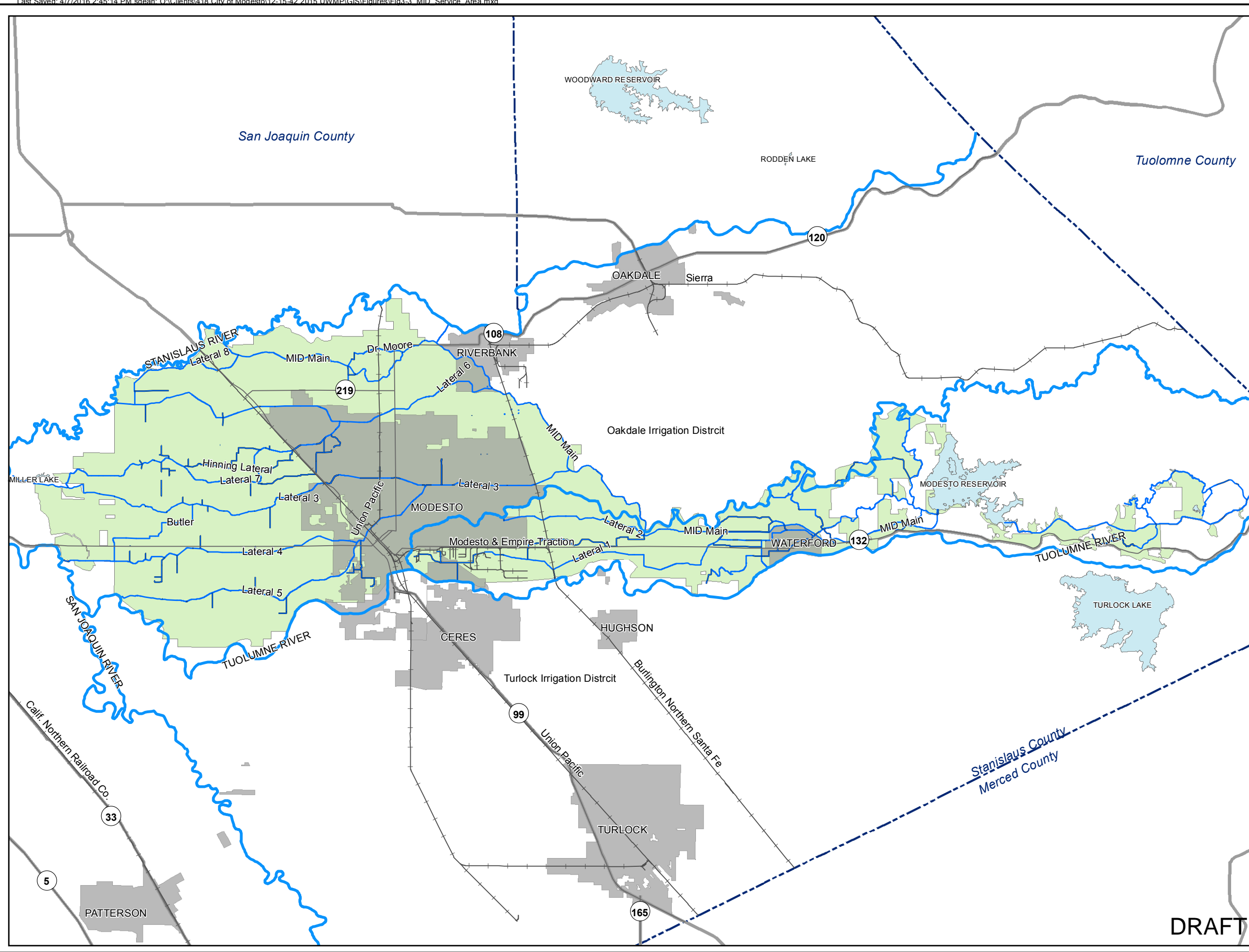
**MID WATER  
SERVICE AREA**



Notes  
1. Source: Modesto Irrigation District.

**LEGEND**

- MID Service Boundary
- Cities
- Lake
- River
- Pipeline/Lateral/Crossing
- Railroad



**DRAFT**

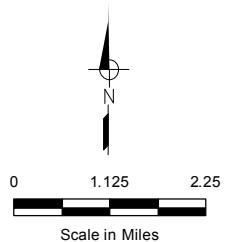
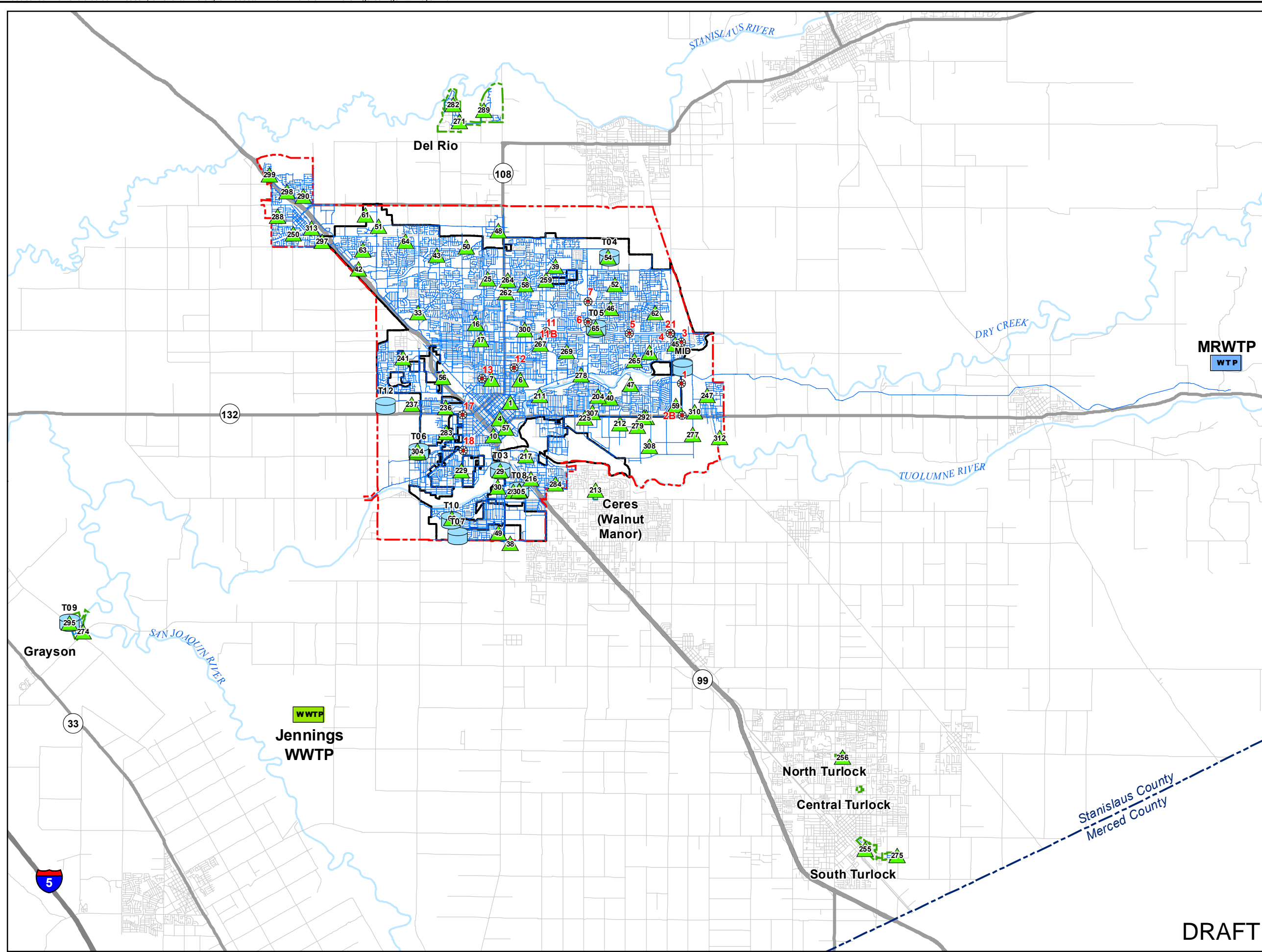


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**FIGURE 3-4**

**City of Modesto / MID  
2015 UWMP**

**CITY OF MODESTO  
EXISTING WATER SYSTEM  
FACILITIES**



- Notes**
1. Pipeline diameters are based on City's current GIS provided by the City on 10/23/2014.
  2. Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford.

**LEGEND**

- Modesto Regional Water Treatment Plant (MRWTP)
- Jennings Wastewater Treatment Plant
- Active Well
- Tank and Booster Pump Station
- MID Turnout
- Existing Pipeline
- Contiguous Service Area
- Outlying Service Areas
- City Limits

**DRAFT**



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This chapter describes and quantifies the City and MID's past, current, and projected water use. Water demand projections are based on the projected growth within the City's service area. Accurately tracking and reporting current water demands allows the City to properly analyze the use of their water resources and conduct good resource planning for the future.

### 4.1 RECYCLED VERSUS POTABLE AND RAW WATER DEMAND

The City purchases potable water from MID and also treats pumped groundwater to potable water use standards. Potable water is water that is safe to drink and which typically has had various levels of treatment and disinfection.

Recycled water is municipal wastewater that has been treated to a specified quality to enable it to be used again. The City currently uses secondary-treated recycled water for agricultural irrigation of roughly 2,500 acres of fodder and feed crops on City-owned land. Due to geographical and financial constraints to supply tertiary recycled water inside the City's water service area, the City is currently moving forward with a project to supply tertiary treated recycled water to the neighboring Del Puerto Water District, as well as other potential users in western Stanislaus County. The City does not currently use recycled water to offset potable water use in its water service area nor does it anticipate to do so in the future.

Raw water is untreated water that is used in its natural state or with minimal treatment. The City does not deliver raw water to any customers in its water service area.

### 4.2 WATER USES BY SECTOR

This section describes the City's and MID's past, current and projected water use by sector through the year 2040 in five-year increments. This section identifies water usage among different water use sectors including single-family residential, multi-family residential, commercial, industrial, institutional/governmental, landscape irrigation, and others. These classifications were used to analyze current consumption patterns among various types of customers. The City and MID use the same definitions for each sector as outlined in the DWR Guidebook:

- **Single-family residential:** A single-family dwelling unit. A lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.
- **Multi-family residential:** Multiple dwelling units contained within one building or several buildings within one complex.
- **Commercial:** A water user that provides or distributes a product or service (CWC 10608.12(d)).
- **Industrial:** A water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development (CWC 10608.12(h)).

- **Institutional (and governmental):** A water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions (CWC 10608.12(i)).
- **Landscape:** Water connections supplying water solely for landscape irrigation. Such landscapes may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the connection is solely for landscape irrigation.
- **Sales to other agencies:** Water sales made to another agency. Projected sales may be based on projected water demand provided by the receiving agency. There is inherent uncertainty in future demand projections, therefore, any projected sales reported in the UWMP are for planning purposes only and are not considered a commitment on the part of the seller.
- **Other:** Any other water demand that is not adequately described by the water sectors defined above. Unlike previous UWMPs, system water losses are not to be reported in the “Other” category.
- **Losses:** System losses are the difference between the actual volume of water treated and delivered into the distribution system and the actual metered consumption.

The City and MID’s past urban water use is categorized by water use sectors in Table 4-1. These historical volumes are different from the totals presented in the 2010 UWMP because: (1) water production from the Hickman and Waterford service areas are excluded; and (2) more recent updates to the City’s metered water use database have been made to provide more accurate totals.

**Table 4-1. Historical Water Use by Sector, AFA**

| Water Use Type             | 2010 Actual Volume <sup>(a,b)</sup> |                    |
|----------------------------|-------------------------------------|--------------------|
|                            | City                                | MID <sup>(c)</sup> |
| Single-Family              | 16,596                              | 0                  |
| Multi-Family               | 5,389                               | 0                  |
| Commercial                 | 8,050                               | 0                  |
| Industrial                 | 3,209                               | 0                  |
| Institutional/Governmental | 2,013                               | 0                  |
| Landscape                  | 2,567                               | 0                  |
| Sales to Other Agencies    | 0                                   | 30,645             |
| Other - Unmetered          | 18,737                              | 0                  |
| Losses (10 percent)        | 6,285                               | 0                  |
| <b>Total</b>               | <b>62,846</b>                       | <b>30,645</b>      |

(a) Volumes do not include production from Hickman and Waterford service areas, which are no longer served by the City.  
 (b) Based on data from the City’s Water Master Plan.  
 (c) MID does not directly serve municipal water users and the total volume reflects actual deliveries to the City.

The current and projected water use for the City and MID are discussed below in separate sections.

**4.2.1 City Water Use**

The City’s actual potable water demands for the calendar year 2015 are reported in Table 4-2. There are no existing or projected uses for saline barriers, groundwater recharge, conjunctive use, or raw water within the City’s service area.

**Table 4-2. Retail: Demands for Potable and Raw Water – Actual (DWR Table 4-1 Retail)**

| Use Type                   | 2015 Actual                                  |                                      |               |
|----------------------------|--|--------------------------------------|---------------|
|                            | Additional Description<br><i>(as needed)</i> | Level of Treatment<br>When Delivered | Volume        |
| Single Family              |  | Drinking Water                       | 20,203        |
| Multi-Family               |  | Drinking Water                       | 4,710         |
| Commercial                 |  | Drinking Water                       | 7,537         |
| Industrial                 |  | Drinking Water                       | 2,728         |
| Institutional/Governmental |  | Drinking Water                       | 1,486         |
| Landscape                  |  | Drinking Water                       | 1,744         |
| Other                      | Unmetered water uses                         | Drinking Water                       | 4,305         |
| Losses                     |  | Drinking Water                       | 4,746         |
| <b>TOTAL</b>               |  |                                      | <b>47,459</b> |

NOTES: Volumes are in AF; volumes do not include demands from Hickman and Waterford.

Water demand projections in this 2015 UWMP are based on potable water demand projections developed for the City’s Water Master Plan (2016) and were developed based on remaining vacant land assumed to be developed by buildout (estimated at 2050) in the City’s service area. Table 4-3 reports the City’s projected potable water demands through the year 2040.

**Table 4-3. Retail: Demands for Potable and Raw Water – Projected (DWR Table 4-2 Retail)**

| Use Type                   | Additional Description<br>(as needed) | Projected Water Use |               |               |               |               |
|----------------------------|---------------------------------------|---------------------|---------------|---------------|---------------|---------------|
|                            |                                       | 2020                | 2025          | 2030          | 2035          | 2040-opt      |
| Single Family              |                                       | 35,873              | 38,681        | 41,489        | 44,297        | 47,106        |
| Multi-Family               |                                       | 6,894               | 7,434         | 7,974         | 8,514         | 9,053         |
| Commercial                 |                                       | 11,032              | 11,895        | 12,759        | 13,622        | 14,486        |
| Industrial                 |                                       | 3,993               | 4,306         | 4,618         | 4,931         | 5,243         |
| Institutional/Governmental |                                       | 2,174               | 2,345         | 2,515         | 2,685         | 2,855         |
| Landscape                  |                                       | 2,553               | 2,753         | 2,953         | 3,153         | 3,353         |
| Other                      | Unmetered water uses                  | 0                   | 0             | 0             | 0             | 0             |
| Losses                     |                                       | 6,947               | 7,490         | 8,034         | 8,578         | 9,122         |
| <b>TOTAL</b>               |                                       | <b>69,466</b>       | <b>74,904</b> | <b>80,342</b> | <b>85,780</b> | <b>91,218</b> |

NOTES: Volumes are in AF. Projected water use is based on the City of Modesto Water Master Plan.

Table 4-4 summarizes the City’s actual and projected water demands reported in Tables 4-2 and 4-3, and the recycled water demands reported in Chapter 6.

**Table 4-4. Retail: Total Water Demands (DWR Table 4-3 Retail)**

|                           | 2015          | 2020          | 2025          | 2030          | 2035          | 2040<br>(opt) |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Potable and Raw Water     | 47,459        | 69,466        | 74,904        | 80,342        | 85,780        | 91,218        |
| Recycled Water Demand     | 0             | 0             | 0             | 0             | 0             | 0             |
| <b>TOTAL WATER DEMAND</b> | <b>47,459</b> | <b>69,466</b> | <b>74,904</b> | <b>80,342</b> | <b>85,780</b> | <b>91,218</b> |

NOTES: Volumes are in AF.

#### 4.2.2 MID Water Use

MID has not delivered potable, raw, or recycled water directly to urban customers in the past and present and does not plan to do so in the future.

MID’s actual volume of water sold to the City for the calendar year 2015 is reported in Table 4-5.

**Table 4-5. Wholesale: Demands for Potable and Raw Water – Actual (DWR Table 4-1 Wholesale)**

| Use Type                | 2015 Actual                                  |                                   |               |
|-------------------------|--|-----------------------------------|---------------|
|                         | Additional Description<br><i>(as needed)</i> | Level of Treatment When Delivered | Volume        |
| Sales to other agencies | City of Modesto                              | Drinking Water                    | 15,401        |
| Losses                  |  | Drinking Water                    | 31            |
| <b>TOTAL</b>            |  |                                   | <b>15,432</b> |

NOTES: Volumes are in AF.

MID’s projected urban water demands (sales to the City) through the year 2040 are reported in Table 4-6.

**Table 4-6. Wholesale: Demands for Potable and Raw Water – Projected (DWR Table 4-2 Wholesale)**

| Use Type                | Additional Description<br><i>(as needed)</i> | Projected Water Use |               |               |               |                     |
|-------------------------|--|---------------------|---------------|---------------|---------------|---------------------|
|                         |  | 2020                | 2025          | 2030          | 2035          | 2040 ( <i>opt</i> ) |
| Sales to other agencies | City of Modesto                              | 44,800              | 48,533        | 52,267        | 56,000        | 59,733              |
| <b>TOTAL</b>            |  | <b>44,800</b>       | <b>48,533</b> | <b>52,267</b> | <b>56,000</b> | <b>59,733</b>       |

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).

Table 4-7 summarizes the actual and projected water demands reported in Tables 4-5 and 4-6, and the recycled water demands reported in Chapter 6.

**Table 4-7. Wholesale: Total Water Demands (DWR Table 4-3 Wholesale)**

|                           | 2015          | 2020          | 2025          | 2030          | 2035          | 2040( <i>opt</i> ) |
|---------------------------|---------------|---------------|---------------|---------------|---------------|--------------------|
| Potable and Raw Water     | 15,432        | 44,800        | 48,533        | 52,267        | 56,000        | 59,733             |
| Recycled Water Demand     | 0             | 0             | 0             | 0             | 0             | 0                  |
| <b>TOTAL WATER DEMAND</b> | <b>15,432</b> | <b>44,800</b> | <b>48,533</b> | <b>52,267</b> | <b>56,000</b> | <b>59,733</b>      |

NOTES: Volumes are in AF.

### 4.3 DISTRIBUTION SYSTEM WATER LOSSES

System losses are the difference between the actual volume of water treated and delivered into the distribution system and the actual metered consumption. Such apparent losses are always present in a water system due to pipe leaks, unauthorized connections or use; faulty meters; unmetered services such as fire protection and training, and system and street flushing.

The estimated annual system losses for the City’s service area (i.e., the difference between the annual production and annual sales) for the most recent 12-month period available (beginning on January 1, 2015) are summarized in Table 4-8. Actual water losses within the City’s water system cannot be confirmed until the City has completed its current efforts to implement metering Citywide. The completion of the City’s meter retrofit program is expected to be in 2020. Therefore, unaccounted-for water and system losses are currently assumed to be approximately 10 percent of the City’s total water production.

**Table 4-8. Retail: 12-Month Water Loss Audit Reporting (DWR Table 4-4 Retail)**

| Reporting Period Start Date  | Volume of Water Loss* |
|--|-----------------------|
| 01/2015  | 4,746                 |
| <i>* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.</i> |                       |
| NOTES: Volumes are in AF. A copy of the City of Modesto's 2015 Water Audit is provided in Appendix E.                    |                       |

MID does not directly serve any municipal water customers, and therefore has no water distribution system losses. However, MID does have some losses within its transmission system which are reflected in their most recent 12-month water loss audit reporting, as reported in Table 4-9.

**Table 4-9. Wholesale: 12-Month Water Loss Audit Reporting (DWR Table 4-4 Wholesale)**

| Reporting Period Start Date  | Volume of Water Loss* |
|--|-----------------------|
| 01/2015  | 31                    |
| <i>* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.</i> |                       |
| NOTES: Volumes are in AF. A copy of MID's 2015 Water Audit is provided in Appendix E.                                    |                       |

Copies of the City’s and MID’s 2015 Water Audit worksheets are provided in Appendix E.

**4.4 ESTIMATING FUTURE WATER SAVINGS**

The water use projections presented in Table 4-4 are based on land use projections within the City’s water service area and are described further in the City’s Water Master Plan (2016). Additional water savings from codes, standards, ordinances, or transportation and land use plans, also known as passive savings, can decrease the water use for new and future customers. However, as shown in Table 4-10 below, these potential passive savings have not been included in the City’s water demand projections.

**Table 4-10. Retail Only: Inclusion in Water Use Projections (DWR Table 4-5 Retail)**

|   |     |
|---|-----|
| Are Future Water Savings Included in Projections?             | No  |
| Are Lower Income Residential Demands Included In Projections? | Yes |

**4.5 WATER USE FOR LOWER INCOME HOUSEHOLDS**

SB 1087 (2006) requires that water providers develop written policies that give priority to development that includes affordable housing to low-income households (Government Code Section 65589.7). The City passed Resolution 2006-508 on August 8, 2006, adopting written procedures to uphold this legislation.

The projected water demands shown in Table 4-3 include water use for single-family and multi-family residential housing needed for low-income households, as identified in the City’s Housing Element. A lower income household is defined as a household that has an income below 80 percent of the Area Median Income (AMI), adjusted for family size. According to the City’s Housing Element (2015-2023), the percent of City of Modesto households with incomes below 80 percent of the AMI was approximately 38 percent in 2013<sup>1</sup>.

Therefore, based on the 2013 housing data for the City of Modesto, it is estimated that approximately 38 percent of the City’s water demands are attributed to low income households. Table 4-11 presents the projected water demands for low income single-family and multi-family residential households.

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<sup>1</sup> Chapter 2 Housing Needs Assessment, Table 2-5: 2013 Household Incomes: California, San Joaquin Valley, and Modesto, City of Modesto Draft Housing Element (2015-2023), January 2016.

**Table 4-11. Projected Water Demands for Lower Income Households**

| Water Use Sector   | Water Demands for Low Income Households <sup>(a)</sup> , AFA |        |        |        |        |
|--|--|--------|--------|--------|--------|
|  | 2020   | 2025   | 2030   | 2035   | 2040   |
| Single-Family  | 13,632   | 14,699 | 15,766 | 16,833 | 17,900 |
| Multi-Family   | 2,620  | 2,825  | 3,030  | 3,235  | 3,440  |
| Total  | 16,252   | 17,524 | 18,796 | 20,068 | 21,340 |
| <sup>(a)</sup> Based on data from the City's Housing Element indicating that approximately 38 percent of households in the City's service area are classified as low income. |  |        |        |        |        |

As shown in Table 4-10, water demands for the lower income households are included in the City's water demand projections.

**4.6 CLIMATE CHANGE**

The City's water demand and use patterns may be impacted by climate change. Increased irrigation demand is anticipated to occur due to temperature rise, increased evaporative losses from warmer temperatures, and a longer growing season. In addition, wildfire frequency may increase as a result of climate change which would increase the fire industry's water demands. A general discussion regarding the potential impacts of climate change on the City and MID's water supplies are described in *Chapter 6 System Supplies*.



## CHAPTER 5

### SB X7-7 Baselines and Targets



In November 2009, SB X7-7, the Water Conservation Act of 2009, was signed into law by Governor Arnold Schwarzenegger as part of a comprehensive water legislation package. The Water Conservation Act addresses both urban and agricultural water conservation. The legislation sets a goal of achieving a 20 percent statewide reduction in urban per capita water use by the year 2020 (i.e., “20 by 2020”), and directs urban retail water suppliers to establish an “interim” per capita water use target to be met by 2015 and a “final” per capita water use target to be met by 2020.

It should be noted that wholesale water suppliers are not required to establish and meet baselines and targets for daily per capita water use, nor are wholesalers required to complete the SB X7-7 Verification Forms. However, wholesale agencies are required to provide an assessment of present and proposed programs and policies that will help the retail water supplier achieve their SB X7-7 water use reduction targets. A discussion of MID’s programs and policies for water conservation is provided in *Chapter 9 Demand Management Measures*. Therefore, the remainder of this chapter will focus on SB X7-7 baselines and targets for only the City’s water service area.

The City’s compliance with SB X7-7 was first addressed in the 2010 UWMP. The City’s baseline per capita water use was determined, and urban water use targets for 2015 and 2020 were established and adopted. SB X7-7 included a provision that an urban water supplier may update its 2020 urban water use target in its 2015 UWMP, and may use a different target method than was used in 2010. Also, the SB X7-7 methodologies developed by DWR in 2011 noted that water suppliers may revise population estimates for baseline years when the 2010 U.S. Census information became available (as described below, the 2010 U.S. Census data was not finalized until 2012).

The DWR Guidebook indicates that there were significant discrepancies between the DOF estimated 2010 population (based on 2000 U.S. Census data) and the actual 2010 population (based on 2010 U.S. Census data). Therefore, if a water supplier did not use 2010 U.S. Census data for their baseline population calculations in the 2010 UWMP, DWR has determined that these water suppliers must recalculate their baseline population for the 2015 UWMP using 2000 and 2010 U.S. Census data, and baseline, and 2015 and 2020 urban water use targets must be modified accordingly.

This chapter provides a review and update of the City’s baseline per capita water use, 2015 interim per capita water use target, and 2020 final per capita water use target in accordance with the requirements described in the DWR Guidebook and based on the 2010 U.S. Census population data. The City calculated baselines and targets on an individual reporting basis in accordance with SB X7-7 legislation requirements and *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (DWR, 2016). The City has achieved compliance with its 2015 interim target, as discussed below, and is positioned to achieve its 2020 final target. Regional Alliance baselines and targets are discussed in Section 5.8.

Additional information on the City’s baselines, targets, and compliance is provided in the SB X7-7 Verification Forms which are referenced throughout this chapter and included in Appendix F.

## 5.1 UPDATING CALCULATIONS FROM 2010 UWMP

*CWC 10608.20(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*

*Methodologies DWR 2016, Methodology 2 Service Area Population Page 25 - Water suppliers may revise population estimates for baseline years between 2000 and 2010 when 2010 census information becomes available. DWR will examine discrepancy between the actual population estimate and DOF's projections for 2010; if significant discrepancies are discovered, DWR may require some or all suppliers to update their baseline population estimates.*

*DWR Guidebook, Required Use of 2010 U.S. Census Data page 5-5 – if an agency did not use 2010 Census data for their baseline population calculations in the 2010 UWMP...DWR has determined that these agencies must recalculate their baseline populations for the 2015 UWMPs using 2000 and 2010 Census data. This may affect the baseline and target GPCD values calculated in the 2010 UWMP, which must be modified accordingly in the 2015 UWMP.*

Population data from the 2010 U.S. Census were not made available until 2012, after the City submitted its 2010 UWMP. Therefore, the City updated population, baselines, and targets for this 2015 UWMP to reflect 2010 U.S. Census data. The following sections describe these updates.

## 5.2 BASELINE PERIODS

SB X7-7 requires each urban water retailer to determine their baseline daily per capita water use, measured in gallons per capita per day (Baseline GPCD), over a 10-year or 15-year baseline period. The 10-year baseline period is defined as a continuous 10-year period ending no earlier than December 31, 2004 and no later than December 31, 2010. SB X7-7 also defines that for those urban water retailers that met at least 10 percent of their 2008 water demand using recycled water, the urban water retailer can extend the Baseline GPCD calculation for a maximum of a continuous 15-year baseline period, ending no earlier than December 31, 2004 and no later than December 31, 2010. SB X7-7 also requires each urban water retailer to determine a 5-year baseline per capita water demand, which DWR calls the Target Confirmation, calculated over a continuous 5-year period ending no earlier than December 31, 2007 and no later than December 31, 2010.

Based on these requirements, the City has selected the following baseline periods:

- 10-year Baseline Period: 1999 to 2008
- 5-year Baseline Period: 2003 to 2007

These baseline periods are listed in SB X7-7 Table 1 of Appendix F. It should be noted that these 10-year and 5-year periods are the same as reported in the 2010 UWMP.

## 5.3 SERVICE AREA POPULATION

*DWR Guidebook, Required Use of 2010 U.S. Census Data page 5-5 – if an agency did not use 2010 Census data for their baseline population calculations in the 2010 UWMP...DWR has determined that these agencies must recalculate their baseline populations for the 2015 UWMPs using 2000 and 2010 Census data. This may affect the baseline and target GPCD values calculated in the 2010 UWMP, which must be modified accordingly in the 2015 UWMP.*

This section includes a discussion of the City’s service area population including 2000 and 2010 U.S. Census data. Population reported in the 2010 UWMP did not include 2010 U.S. Census data because the full Census data set was not available until 2012. Therefore, the City updated the current and historical service area population for this 2015 UWMP to reflect 2010 U.S. Census data.

As described in Chapter 3, the City’s service area consists of one large “contiguous” service area and several “outlying” non-contiguous service areas. The central contiguous service includes Modesto, Salida, portions of North Ceres, and several unincorporated Stanislaus County “islands” (Empire, Bret Harte, Shackelford, and West Modesto, among several others). The outlying service areas are not contiguous to the central service area and include Grayson, Del Rio, Ceres (Walnut Manor), and portions of Turlock. As mentioned previously, as of July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford, and therefore their current and historical service area populations have been removed from the City’s SB X7-7 analysis.

DOF population data was used to determine the City’s service area population, where available. The DOF uses U.S. Census data, combined with changes to the housing stock, estimated occupancy of housing units, and the number of persons per household to estimate annual population within jurisdictional boundaries. Where DOF data are not available (e.g., Turlock and Ceres (Walnut Manor) areas), the population has been estimated based on a count of existing dwelling units served by the City (from aerial photographs) and an estimated housing density (people per dwelling unit) based on Census data for the surrounding communities.

Historical service area population during the 10- and 5-year baseline periods are shown in SB X7-7 Table 3 of Appendix F.

#### **5.4 GROSS WATER USE**

Annual gross water use is the water that enters the City’s distribution system over a 12-month period (calendar year) with certain exclusions. This section discusses the City’s annual gross water use for each year in the baseline periods, as well as 2015, in accordance with Methodology 1 of DWR’s *Methodologies* document.

*CWC 10608.12(g) “Gross Water Use” means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:*

- (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.*
- (2) The net volume of water that the urban retail water supplier places into long term storage.*
- (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.*
- (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.*

*California Code of Regulations Title 23 Division 2 Chapter 5.1 Article Section 596 (a) An urban retail water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector.*

The City's gross water use is based on the metered quantity of water purchased from MID and the groundwater produced by the City's municipal wells. Annual gross water use for the baseline periods and 2015 are summarized by source in SB X7-7 Table 4-A of Appendix F. It should be noted that the historical volumes presented are different from the totals presented in the 2010 UWMP because water production from the Hickman and Waterford service areas are excluded.

### **5.5 BASELINE DAILY PER CAPITA WATER USE**

As indicated above, daily per capita water use is reported in gallons per capita per day (GPCD). Annual gross water use is divided by annual service area population to calculate the annual per capita water use for each year in the baseline periods. As discussed above, the City has used updated service area population data for this 2015 UWMP. The City's baseline daily per capita was use has been calculated as follows:

- 10-year Base Daily Per Capita Water Use
  - 285 GPCD (for the period from 1999 to 2008)
  - This value is the same value calculated in the 2010 UWMP (285 GPCD)
- 5-year Base Daily Per Capita Water Use
  - 279 GPCD (for the period from 2003 to 2007)
  - This value is 1 GPCD more than the value calculated in the 2010 UWMP (278 GPCD)

These values are shown in SB X7-7 Table 5 of Appendix F.

### **5.6 2015 AND 2020 TARGETS**

SB X7-7 requires a state-wide average 20 percent reduction of urban per capita water use by the year 2020. Therefore, the City must set an interim (2015) water use target and a final (2020) water use target using one of four methods defined by SB X7-7 and DWR. Three of these methods are defined in Water Code Section 10608.20(a)(1), and the fourth method was developed by DWR. The 2020 water use target is calculated using one of the following four methods:

- Method 1: 80 percent of the City's base daily per capita water use;
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial, and institutional uses;
- Method 3: 95 percent of the applicable State hydrologic region target as stated in the State's 2010 20x2020 Water Conservation Plan; or
- Method 4: An approach that considers the water conservation potential from (1) indoor residential savings, (2) metering savings, (3) commercial, industrial and institutional savings, and (4) landscape and water loss savings.

Analysis using Methods 1 and 3 are included in Appendix F (SB X7-7 Tables 7A and 7E). The calculated 2020 target using Method 1 is 228 GPCD. The calculated 2020 target using Method 3 is 165 GPCD. Methods 2 and 4 require specific data which were not available, so those two methods were not considered. Target Method 1 results in the highest allowable SB X7-7 final (2020) target (228 GPCD by 2020), and would be the most favorable for the City.

The 2015 interim targets for each of the target methods are calculated based on the midpoint of the City’s 10-year Base Daily Per Capita Water Use and the 2020 targets calculated for each of the respective target methods. The 2015 interim 2015 target is the midpoint between the City’s 10-Year Base Daily Per Capita Water Use (285 GPCD) and the final 2020 target (228 GPCD). Therefore, the City’s interim 2015 target is 257 GPCD (SB X7-7 Table 8).

Urban water suppliers must verify that their 2020 final water use target is at least a 5 percent reduction from the 5-year baseline GPCD. As shown in SB X7-7 Table 7F of Appendix F, the City’s maximum 2020 target is 265 GPCD (95 percent of the City’s 5-year base daily per capita water use of 279 GPCD). The City’s Method 1 2020 target of 228 GPCD complies with the minimum reduction.

The City’s interim and final targets are summarized in Table 5-1.

**Table 5-1. Baselines and Targets Summary (DWR Table 5-1)**

| Baseline Period   | Start Year | End Year | Average Baseline GPCD* | 2015 Interim Target * | Confirmed 2020 Target* |
|---|------------|----------|------------------------|-----------------------|------------------------|
| 10-15 year  | 1999       | 2008     | 285                    | 257                   | 228                    |
| 5 Year  | 2003       | 2007     | 279                    |                       |                        |
| *All values are in Gallons per Capita per Day (GPCD)  |            |          |                        |                       |                        |
| NOTES: Historical per capita use from Hickman and Waterford are not included in calculations. |            |          |                        |                       |                        |

For this 2015 UWMP, the City has selected Target Method 1, as was used in the 2010 UWMP. The recalculated interim 2015 target of 257 GPCD is 1 GPCD higher than the interim 2015 target reported in the 2010 UWMP (256 GPCD). The recalculated final 2020 target of 228 GPCD is the same final 2020 target reported in the 2010 UWMP (228 GPCD). The City understands that the target method and resulting targets may not be changed in any amendments to the 2015 UWMP or in the 2020 UWMP.

**5.7 2015 COMPLIANCE DAILY PER CAPITA WATER USE**

The City has calculated its actual 2015 water use for the 2015 calendar year in accordance with Methodology 4 of DWR’s *Methodologies* document. As shown in Table 5-2, urban per capita water use in 2015 was 163 GPCD, which is well below the 2015 interim water use target of 257 GPCD. Therefore, the City has met its interim 2015 water use target. The complete set of SB X7-7 verification tables used to document this compliance is included in Appendix F.

## Chapter 5

### SB X7-7 Baselines and Targets



**Table 5-2. 2015 Compliance (DWR Table 5-2)**

| Actual<br>2015 GPCD*  | 2015<br>Interim<br>Target<br>GPCD* | Optional Adjustments to 2015 GPCD<br><i>From Methodology 8</i> |                         |                           |                       |                        | 2015 GPCD*<br><i>(Adjusted if<br/>applicable)</i> | Did Supplier<br>Achieve<br>Targeted<br>Reduction for<br>2015? Y/N |
|---|------------------------------------|--|-------------------------|---------------------------|-----------------------|------------------------|---|---|
|   |                                    | Extraordinary<br>Events*                                       | Economic<br>Adjustment* | Weather<br>Normalization* | TOTAL<br>Adjustments* | Adjusted<br>2015 GPCD* |   |   |
| 163   | 257                                | 0  | 0                       | 0                         | 0                     | 163                    | 163   | Yes   |
| <i>*All values are in Gallons per Capita per Day (GPCD)</i>                                   |                                    |  |                         |                           |                       |                        |   |   |
| NOTES: Historical per capita use from Hickman and Waterford are not included in calculations. |                                    |  |                         |                           |                       |                        |   |   |

As detailed in DWR’s *Methodologies* document, there are allowable adjustments that can be made to an agency’s gross water use in 2015 for unusual weather, land use changes, or extraordinary institutional water use. The City has elected not to make the adjustments allowed by Water Code Section 10608.24 because these exceptions are not needed to demonstrate compliance with SB X7-7 for 2015. Water use in 2015 in the City’s service area was significantly reduced as compared to recent years as a result of increased water conservation efforts by the City and its customers (both voluntary and mandatory water use restrictions) in response to the severe drought conditions statewide.

### 5.8 REGIONAL ALLIANCE

The City has chosen to comply with the requirements of SB X7-7 on an individual basis, and did not participate in a regional alliance. Because the City was able to achieve compliance with SB X7-7 on an individual basis, the Regional Alliance compliance per capita water demand was not calculated.

This chapter describes and reviews the sources of water that may be available to the City and MID. Supply sources such as surface water, supplies from other agencies, groundwater, stormwater, wastewater and recycled water, desalinated water, and exchanges or transfers are discussed below. The origin of the water supply, water quality, and quantity issues, as well as the anticipated actions to meet future demands for each water source are discussed.

The City currently uses a conjunctive water use strategy with two primary water sources to meet potable water demands within the City's service area. These include:

- Surface water from the Tuolumne River via Modesto Reservoir and treated at MID's MRWTP, which is purchased on a wholesale basis from MID; and
- Local groundwater pumped from City wells located throughout the City's service area.

City residents within the contiguous service area north of the Tuolumne River (including North Modesto, Salida, and Empire) generally rely on treated surface water supply from MID year-round, supplemented with groundwater as needed. Water demands for the contiguous service area located south of the Tuolumne River (South Modesto) and the City's outlying service areas are met entirely with groundwater supply year-round.

#### 6.1 OVERVIEW

Prior to 1995, all municipal and industrial (M&I) water demands in the City were met from groundwater pumping. Beginning in the 1940s, increased water demands resulting from growth, along with periodic drought conditions, contributed to a reduction in groundwater levels and created a cone of depression under the City. This cone of depression, combined with increasingly stringent federal and state water quality requirements, prompted a 1983 study of the City's groundwater supply. This study recommended a conjunctive water use program that would supplement the City's M&I groundwater supply with treated surface water from the Tuolumne River. Following the recommendations from the study, the City, MID and the former Del Este Water Company<sup>1</sup> formed a partnership to use a portion of MID's surface water supplies for municipal water use. In 1995, treated surface water deliveries to the City began from the Phase One MRWTP, which has an annual average treatment capacity of 30 MGD.

The following sections provide a detailed discussion regarding the surface water supply for MID and the purchased water and groundwater supply for the City.

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<sup>1</sup> In 1995, the City acquired the Del Este Water Company.

## 6.2 SURFACE WATER

This section describes the treatment and delivery of MID's surface water supply to the City. The City does not have a separate surface water supply and currently relies on treated surface water purchased from MID on a wholesale basis. A discussion of the wholesale water supply to the City, including the agreements governing the treated surface water deliveries from MID, is provided in Section 6.3.

### 6.2.1 Surface Water Supply for MID

MID is primarily an agricultural water supplier that provides irrigation water to approximately 3,400 irrigation accounts. MID serves a gross irrigation service area of approximately 103,733 acres; however, MID's irrigated acreage may vary in any given year. In 2012, approximately 63,313 acres (66,451 acres, less 3,138 idle acres) were irrigated with surface water, MID groundwater, and private groundwater.<sup>2</sup> In addition to its irrigation accounts, MID also provides treated surface water to the City's contiguous service area north of the Tuolumne River (North Modesto, Salida and Empire).

Together with the Turlock Irrigation District (TID), MID holds senior rights to water from the Tuolumne River. The 1,880-square mile (sq mi) Tuolumne River watershed extends to the high Sierra Nevada Mountains, and the river flows to its confluence with the San Joaquin River approximately ten miles west of Modesto. Most of the water in the Tuolumne River comes from snowmelt, with peak runoff flows occurring from April through July during which time over 60 percent of the annual flow takes place. Within the lower Tuolumne River watershed, MID and TID operate the New Don Pedro Reservoir with a maximum storage capacity of 2,030,000 AF. MID's median annual diversion from the Tuolumne River was approximately 294,000 AF of water (average from 2003 to 2012). Of that amount, approximately 32,900 AF (average from 2003 to 2012) was delivered to the MRWTP for treatment and delivery to the City.

Snowmelt from the central Sierra Nevada is of excellent quality. Surface water diverted from the Tuolumne River at La Grange has a Total Dissolved Solids (TDS) concentration of only about 36 milligrams per liter (mg/L). Other water quality constituents that impact agricultural and domestic water use are also very low or negligible. Also, the quality of the river water is fairly consistent from year to year. As runoff from agricultural and developed land is introduced into the lower part of the river, the overall water quality degrades somewhat, but still remains good.

### 6.2.2 Modesto Regional Water Treatment Plant

The original Phase One MRWTP is a 30 MGD (33,600 AFA) conventional treatment facility owned and operated by MID, which provides flocculation, sedimentation, and filtration, along with ozonation for primary disinfection. Treated surface water from the MRWTP is delivered to the City via MID's terminal reservoir facilities (a booster pump station and two 5 MG storage tanks located on the east side of the City) through a series of turnouts that have the ability to control

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<sup>2</sup> Source: Modesto Irrigation District, 2015 Agricultural Water Management Plan Update, prepared by Provost & Pritchard, December 2015.



water supply from the MID transmission mains at various points within the City's water distribution system. Phase One of the MRWTP has a maximum functional capacity of 42.5 MGD that helps meet the maximum day and peak hour demands, but has been permitted by the State to produce up to 45 MGD.

In October 2005, MID and the City approved the ARTDA, which set forth the MRWTP Phase Two Expansion project that would allow MID to deliver an annual average supply of up to 60 MGD (67,200 AFA) of treated water to the City for municipal use. The MRWTP Phase Two Expansion project involves the construction of a new parallel treatment process consisting of low-pressure membranes, ozone disinfection system, a dissolved air flotation thickener and a new Supervisory Control and Data Acquisition (SCADA) system. Substantial completion of the MRWTP Phase Two Expansion project was reached in October 2015, and the project was accepted as complete by the MID Board of Directors in May 2016. The additional supply available to the City from the MRWTP Phase Two Expansion project is projected to be 10 MGD (11,200 AFA) by 2020 (not accounting for supply reductions due to drought). This quantity is projected to increase as additional development occurs within the City's contiguous service area and within MID's treated water 'place of use' up to an additional total treatment capacity of 30 MGD (33,600 AFA). The actual additional supply available from the MRWTP Phase Two Expansion will be determined based on the amount of agricultural land converted to urban uses.

The combined capacity available at the completion of the MRWTP Phase Two Expansion project (60 MGD or 67,200 AFA) is an annual average, and both the original and expanded facilities will have peaking capacities greater than the annual averages. Peaking capacity for the Phase Two Expansion will be determined after start-up operations and testing protocols are completed.

### 6.3 PURCHASED OR IMPORTED WATER

The treated surface water supply that the City purchases from MID is described below. MID does not purchase wholesale water supplies, and a discussion of MID's water supply was provided in Section 6.2 above. Historically, annual treated surface water deliveries to the City have been relatively consistent, with groundwater pumping varying as need to meet water demands. However, in more recent years due to the on-going drought, MID has reduced surface water deliveries to both its agricultural customers and to the City.

#### 6.3.1 Wholesale Supplies for the City

The TDA, enacted in 1992, established the delivery of treated surface water to the City's contiguous service area north of the Tuolumne River. It obligated MID to deliver 33,600 AF (30 MGD) of treated surface water to the City, commencing on May 1 and ending the following April 30 during normal years. In 1995, the City purchased the Del Este Water Company and, along with it, their proportional share of treated surface water as defined in the TDA<sup>3</sup>.

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<sup>3</sup> In 1995, the City purchased the Del Este Water Company water systems in Empire, Salida, Waterford, Hickman, Grayson, Del Rio, and portions of Ceres and Turlock. In 2015, the City subsequently sold the Waterford and Hickman water systems to the City of Waterford.

As discussed above, in October 2005, MID and the City approved the ARTDA. This agreement supersedes the original TDA and sets forth, among other things, the terms and conditions for the delivery of up to 67,200 AF (60 MGD) of treated water to the City from the expanded MRWTP. The increased water treatment capacity provided by the MRWTP Phase Two Expansion project will allow the City to serve more surface water, thereby reducing its long-term dependence on groundwater.

The ARTDA includes a formula to reduce deliveries in drier than average years based on the number of inches allocated to MID's agricultural customers. The ARTDA specifies a maximum delivery of 42 inches of water, or the amount calculated as  $(y/42)$  times 33,602.1 AFA<sup>4</sup>, whichever is less (where  $y$  is the actual number of inches of water allocated by MID to agricultural water users for the irrigation season<sup>5</sup>). The allocation formula is as follows:

$$\frac{y}{42} \times 33,602.1 = x$$

where,

$y$  is the number of inches of water allocated to MID's agricultural customers, and

$x$  is the calculated amount of water to be delivered to the City in that particular year in AF.

Although the ARTDA specifies a formula for water allocations during shortages, the reduction in supply is not determined until the time of the shortage (ARTDA, Section 17.2 Formula for Water Allocation). A copy of the ARTDA is provided in Appendix G.

The ARTDA also provides the opportunity for the City to purchase additional water from MID (at a higher rate) or to exchange groundwater meeting the requirements of the ARTDA for agricultural use for treated surface water during drought years if such supplemental water supplies are available. Additional discussion regarding the availability and reliability of treated surface water supply from MID in dry years is provided in *Chapter 7 Water Supply Reliability*.

## 6.4 GROUNDWATER

The City relied exclusively on groundwater to meet water demands until the introduction of treated surface water in 1995. The City currently has approximately 86 active groundwater wells in both the contiguous and outlying service areas that have the capacity to produce approximately 125 MGD of groundwater. MID currently pumps groundwater only to supplement water supplies to agricultural customers and does not pump and deliver groundwater supply to urban suppliers. The City and MID's groundwater supplies are discussed separately below.

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<sup>4</sup> As described in the ARTDA, upon completion of MRWTP Phase Two Expansion, the treated water quantity shall be changed from 33,602.1 AFA to 67,204.2 AFA. These are the exact contractual supply volumes and are rounded to 33,600 AFA and 67,200 AFA, respectively, throughout this UWMP.

<sup>5</sup> The irrigation season is defined in the ARTDA to be May 1 through April 30 (e.g., the 2015/2016 irrigation season extends from May 1, 2015 through April 30, 2016).

### 6.4.1 Groundwater Supply for the City

The City has historically relied on groundwater pumped from the San Joaquin Valley Groundwater Basin as a major source of supply. The City’s service area spans three subbasins: the Modesto Subbasin north of the Tuolumne River, the Turlock Subbasin south of the Tuolumne River, and the Delta-Mendota Subbasin west of the San Joaquin River that provides groundwater to the Grayson water system. Figure 6-1 illustrates the location of the City’s water service areas in relation to the boundaries of the three underlying groundwater subbasins.

The residents within the City’s contiguous service area north of the Tuolumne River generally rely on treated surface water supply from MID year-round, and are supplemented with groundwater to meet increased water demands primarily in the summer months. Water demands from the City’s contiguous service area located south of the Tuolumne River (South Modesto) and the outlying service areas are met with groundwater supply year-round.

The following sections further describe the City’s groundwater resource, including a description of the groundwater basin and subbasins, estimated groundwater operational yield, groundwater management activities, and historical groundwater use.

#### 6.4.1.1 Groundwater Basin Description

The City’s service area relies on groundwater pumped from three of the nine subbasins within the San Joaquin Valley Groundwater Basin. Key characteristics of these groundwater subbasins are summarized in Table 6-1. Subbasin descriptions provided below are taken from DWR Bulletin 118 Groundwater Basin Descriptions, which are provided in Appendix H.

**Table 6-1. Groundwater Subbasin Characteristics and Service Areas<sup>(a)</sup>**

| Subbasin Name   | DWR Subbasin No. | General Location              | Surface Area                | City Water Service Areas <sup>(b)</sup>                                      |
|---|------------------|-------------------------------|-----------------------------|--|
| Modesto   | 5-22.02          | North of Tuolumne River       | 247,000 acres (385 sq mi)   | North Modesto<br>South Modesto <sup>(c)</sup><br>Salida<br>Empire<br>Del Rio |
| Turlock   | 5-22.03          | South of Tuolumne River       | 347,000 acres (542 sq mi)   | South Modesto<br>Turlock<br>North Ceres<br>Ceres (Walnut Manor)              |
| Delta-Mendota   | 5-22.07          | West of the San Joaquin River | 747,000 acres (1,170 sq mi) | Grayson  |
| <p><sup>(a)</sup> Based on information published in DWR Bulletin 118 Groundwater Subbasin Descriptions:</p> <ul style="list-style-type: none"> <li>• Modesto Subbasin (last updated February 27, 2004)</li> <li>• Turlock Subbasin (last updated January 20, 2006)</li> <li>• Delta-Mendota Subbasin (last updated January 20, 2006)</li> </ul> <p><sup>(b)</sup> See Figure 6-1 for locations of the City water service areas in relation to the groundwater subbasin boundaries.</p> <p><sup>(c)</sup> The City’s water distribution system in the contiguous service area is interconnected between North and South Modesto areas; groundwater produced in the Modesto Subbasin (North Modesto) can be delivered to South Modesto.</p> <p>sq mi = square miles</p> |                  |                               |                             |  |

Groundwater in the Modesto Subbasin occurs under unconfined, semi-confined, and confined conditions. The unconfined water body occurs in the unconsolidated deposits above and east of the Corcoran Clay, which underlies the southwestern portion of the subbasin at depths ranging from 150 to 250 feet. Where clay lenses restrict the downward flow of groundwater, semi-confined conditions occur. The confined water body occurs in the unconsolidated deposits below the Corcoran Clay and extends downward to the base of fresh water. The estimated average specific yield of this subbasin is 8.8 percent.

There are three groundwater bodies in the Turlock Subbasin: the unconfined water body; the semi-confined and confined water body in the consolidated rock fractures; and the confined water body beneath the E-clay in the western subbasin. The estimated average specific yield of the subbasin is 10.1 percent.

Groundwater in the Delta-Mendota Subbasin occurs in three water-bearing zones. These include the lower zone, which contains confined fresh water in the lower section of the Tulare Formation, an upper zone which contains confined, semi-confined, and unconfined water in the upper section of the Tulare Formation and younger deposits, and a shallow zone which contains unconfined water within about 25 feet of the land surface. The estimated specific yield of this subbasin is 11.8 percent. Land subsidence up to about 16 feet has occurred in the southern portion of the basin due to artesian head decline and consolidation of fine grained materials.

The primary sources of groundwater recharge in all three subbasins are from deep percolation of applied irrigation water and from canals and stream/river seepage. Lesser groundwater recharge occurs from percolation from small streams and direct percolation of precipitation. Table 6-2 provides a summary of estimated natural and applied water recharge and groundwater extraction in each of the three subbasins under the City’s service area.

**Table 6-2. Groundwater Subbasin Recharge and Extraction Estimates<sup>(a)</sup>**

| Subbasin Name   | Natural Recharge, AFA | Applied Water Recharge, AFA | Groundwater Extraction, AFA    |
|---|-----------------------|-----------------------------|--------------------------------|
| Modesto   | 86,000                | 92,000                      | 81,000 (urban)<br>145,000 (ag) |
| Turlock   | 33,000                | 313,000                     | 65,000 (urban)<br>387,000 (ag) |
| Delta-Mendota   | 8,000                 | 74,000                      | 17,000 (urban)<br>491,000 (ag) |
| <sup>(a)</sup> Based on information published in DWR Bulletin 118 Groundwater Subbasin Descriptions: <ul style="list-style-type: none"> <li>• Modesto Subbasin (last updated February 27, 2004)</li> <li>• Turlock Subbasin (last updated January 20, 2006)</li> <li>• Delta-Mendota Subbasin (last updated January 20, 2006)</li> </ul> ag = agriculture |                       |                             |                                |

#### 6.4.1.1.1 Groundwater Level Trends

Groundwater levels in the Modesto Subbasin declined on average nearly 15 feet between 1970 and 2000. However, since augmenting the City's groundwater supply with treated surface water from the MRWTP beginning in 1995, the City has observed that groundwater levels have started to rise, particularly in the Modesto Subbasin, as a result of reduced groundwater pumping. From 1996 to 2000, groundwater levels in the Modesto Subbasin rose approximately 5 feet. Water levels in the Turlock Subbasin, similarly, rebounded about 8 feet from 1994 to 2000, bringing them to approximately 7 feet below the 1970 levels. Water levels in the Delta-Mendota Subbasin increased by an average of 2.2 feet from 1970 through 2000. The rising water levels suggest that the current level of pumping in each subbasin is less than the previously assumed "safe yields".

#### 6.4.1.1.2 Groundwater Quality

The City has historically experienced some issues related to groundwater quality. Concentration levels of arsenic, uranium, perchloroethylene (PCE), trichloroethylene (TCE), dibromochloropropane (DBCP) or nitrate in excess of drinking water regulatory maximum contaminant levels (MCLs) have resulted in sixteen of the City's production wells to be taken out of service (thirteen wells in the North Modesto service area, two wells in the South Modesto service area, and one well in the Turlock service area). These well outages have reduced the City's groundwater pumping capacity.

In general, the quality of groundwater from the Turlock Subbasin, from which the South Modesto wells draw their water, is of relatively poor quality. In the South Modesto area, the City has a total of twelve wells. Of these twelve wells:

- Five wells are active wells that pump directly into the distribution system;
- Five wells are blending wells that produce water of potable quality, but do not meet all secondary MCL criteria for aesthetics (water pumped from these blending wells is pumped into storage tanks and blended with water of better water quality so that the water quality of these blended supplies meets all applicable California Department of Drinking Water (DDW) primary and secondary MCL requirements); and
- Two wells are inactive due to high nitrate concentrations.

To minimize the City's vulnerability to groundwater quality issues, the City has developed strategies to maintain and enhance its groundwater extraction capacity through a combination of well monitoring for early detection, well rehabilitation, wellhead treatment and blending. Through the well monitoring and capital improvement programs, the City expects to maintain sufficient well capacity to meet future water demands. Potential wellhead treatment options to address contaminants in the City's wells are discussed in Section 6.9.

6.4.1.2 Preliminary Operational Yield Estimate

In 2007, the City estimated that their preliminary operational yield from the three groundwater subbasins underlying the City’s service area is approximately 53,500 AFA. This preliminary operational yield was estimated based on historical groundwater pumpage by the City from the Modesto, Turlock, and Delta-Mendota subbasins, and was developed by City staff to maintain a minimum average groundwater elevation of 40 feet above mean sea level (ft msl). A copy of the City’s 2007 Technical Memorandum titled “Discussion on Operational Yield for the 2005 Urban Water Management Plan” documenting this preliminary operational yield is provided in Appendix H.

The general conclusion of the City’s evaluation was that if the total, long-term average, groundwater pumpage quantity is held at or below 53,500 AFA, then stable groundwater levels will result at around 40 ft msl within and near the City’s contiguous service area. If groundwater pumpage is significantly less than 53,500 AFA, groundwater levels will probably rise; thereby, increasing the quantity of available groundwater stored within the basin for later use in dry periods and/or to meet future demands, via “in-lieu” groundwater banking. Alternatively, if more than 53,500 AFA is extracted (e.g., during dry years), groundwater levels will probably decline. Actual annual groundwater pumpage is expected to be less during normal or wet years and higher during dry years. Table 6-3 summarizes the long-term preliminary operational yield assumed for each subbasin.

**Table 6-3. Preliminary Operational Yield Assumed for Each Subbasin<sup>(a)</sup>**

| Groundwater Subbasin  | Allocation, AFA |
|---|-----------------|
| Modesto   | 48,286          |
| Turlock   | 4,900           |
| Delta-Mendota   | 314             |
| Total   | 53,500          |
| <sup>(a)</sup> As documented in the City’s Technical Memorandum titled “Discussion on Operational Yield for the 2005 Urban Water Management Plan” (see Appendix H). |                 |

6.4.1.3 Groundwater Management

Groundwater Management Plans have been prepared for the Modesto, Turlock, and Delta-Mendota subbasins. Links to these groundwater management plans are provided in Appendix H.

The City and MID participated in groundwater management studies initiated by the 1992 California State Assembly Bill 3030 (AB 3030). The goal of this bill, also referred to as the Groundwater Management Act, is to maximize the total groundwater supply while protecting the quality of the groundwater basin. The Stanislaus and Tuolumne Rivers’ Groundwater Basin Association completed the Integrated Regional Groundwater Management Plan for the Modesto Subbasin in 2005 in compliance with the Groundwater Management Planning Act of 2002 (SB 1938) and the Integrated Regional Water Management Planning Act of 2002 (SB 1672). The Stanislaus and Tuolumne Rivers’ Groundwater Basin Association is made up of the following

agencies: City of Modesto, MID, City of Oakdale, Oakdale Irrigation District, City of Riverbank, City of Waterford<sup>6</sup>, and Stanislaus County.

The City also participated in the preparation of the Turlock Groundwater Basin Management Plan, which was prepared by the Turlock Groundwater Basin Association and was completed in 2008. The agencies involved in this association include the City of Modesto, City of Turlock, TID, City of Ceres, City of Hughson, Merced Irrigation District, Eastside Water District, Delhi County Water District, Ballico Community Services District, Ballico-Cortez Water District, Hillmar Water District, Denair Community Services District, the Keyes Community Water District, Stanislaus County, and Merced County.

The City did not participate in the preparation of the *Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area*, which was prepared by the San Luis & Delta-Mendota Water Authority and was completed in 2011 and discusses the Tracy and Delta-Mendota subbasins.

The Modesto, Turlock and Delta-Mendota subbasins are not adjudicated. This means that there is no court-appointed “watermaster” to resolve groundwater pumping issues, and there are no current specific limits on the amount of groundwater that individuals and agencies may extract from the basins. However, on September 16, 2014, Governor Jerry Brown signed into law a three-bill legislative package, composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), collectively known as the Sustainable Groundwater Management Act of 2014 (SGMA). The SGMA empowers local agencies to manage groundwater basins in a sustainable manner over a long-term horizon. Further discussion on the SGMA and its implications for future management of the groundwater subbasins underlying the City’s service areas is provided below.

#### 6.4.1.4 Groundwater Sustainability

As discussed above, the SGMA legislation provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for state intervention when necessary to protect the resource. The legislation lays out a process and a timeline for local authorities to achieve sustainable management of their groundwater basins. For local agencies involved in implementation of the SGMA, the requirements are significant and can be expected to take years to accomplish. The State Water Resources Control Board may intervene if local agencies do not form a Groundwater Sustainability Agency (GSA) and/or fail to adopt and implement a Groundwater Sustainability Plan (GSP). The SGMA implementation steps and deadlines are summarized in Table 6-4.

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<sup>6</sup> In 2015, the Memorandum of Understanding was revised to include the City of Waterford.

**Table 6-4. Sustainable Groundwater Management Act Implementation Steps and Deadlines**

| Implementation Step | Implementation Measure  | Deadlines  |
|---------------------|---|--|
| Step One            | Local agencies must form local Groundwater Sustainability Agencies (GSAs) within two years  | <ul style="list-style-type: none"> <li>• June 30, 2017</li> </ul>  |
| Step Two            | Agencies in basins deemed high- or medium-priority must adopt Groundwater Sustainability Plans (GSPs) within five to seven years, depending on whether a basin is in critical overdraft | <ul style="list-style-type: none"> <li>• January 31, 2020 for critically overdrafted basins</li> <li>• January 31, 2022 for high- and medium-priority basins not currently in overdraft</li> </ul> |
| Step Three          | Once plans are in place, local agencies have 20 years to fully implement them and achieve the sustainability goal   | <ul style="list-style-type: none"> <li>• January 31, 2040 for critically overdrafted basins</li> <li>• January 31, 2042 for high- and medium-priority basins not currently in overdraft</li> </ul> |

The SGMA applies to basins or subbasins designated by the DWR as high- or medium-priority basins based on a statewide ranking that uses criteria including population and extent of irrigated agriculture dependent on groundwater. The final Basin Prioritization findings indicate that 127 of California's 515 groundwater basins and subbasins are high- and medium-priority basins. These high- and medium-priority basins account for 96 percent of California's annual groundwater pumping and supply 88 percent of the population which resides over the groundwater basins. The rankings of the groundwater subbasins underlying the City's service areas are shown in Table 6-5. As shown, all three of the City's underlying groundwater subbasins have been designated as high-priority basins, and the Delta-Mendota subbasin has also been identified to be a critically overdrafted basin.

**Table 6-5. Groundwater Basin Prioritization for Sustainable Groundwater Management Act<sup>(a)</sup>**

| Rank | Basin Number | Subbasin Name | Overall Basin Ranking Score | Overall Basin Priority             |
|------|--------------|---------------|-----------------------------|------------------------------------|
| 13   | 5-22.02      | Modesto       | 23.5                        | High                               |
| 26   | 5-22.07      | Delta-Mendota | 22.3                        | High; Critically Overdrafted Basin |
| 38   | 5-22.03      | Turlock       | 21.5                        | High                               |

<sup>(a)</sup> CASGEM Groundwater Basin Prioritization Results, run version May 26, 2014.

The Stanislaus and Tuolumne Rivers' Groundwater Basin Association are currently discussing their strategy for complying with SGMA and strategizing on forming GSAs and developing GSPs as guidelines are developed. Several of the activities required by the SGMA are not expected to be finalized until June 2016; therefore, new requirements for groundwater management under the SGMA do not apply to this 2015 UWMP, but will be addressed in the 2020 UWMP.



#### 6.4.1.5 Overdraft Conditions

A groundwater basin's sustainable, or "safe" yield is defined as the average annual amount of groundwater that can be extracted from the groundwater basins, while maintaining a non-overdraft condition. The Modesto and Turlock subbasins have not been identified by DWR as being critically overdrafted basins; however, the Delta-Mendota Subbasin has recently been identified as being a critically overdrafted basin. The Delta-Mendota Subbasin was not previously identified as being critically overdrafted in DWR Bulletin 118; however, per the requirements of the SGMA (described above), DWR was directed to review and evaluate groundwater conditions from 1989 to 2009 to develop a revised list of critically overdraft basins (conditions from 2011 to 2015 were not considered as the SGMA legislation requires the current drought period to be excluded from the evaluation). Based on this recent evaluation, the Delta-Mendota Subbasin was added to the list of critically overdrafted basins.

The City currently maximizes the use of its treated surface water supply from MID in normal and wetter years. The use of this treated surface water supply gives the City flexibility to preserve its groundwater supplies through in-lieu banking. Additional treated surface water supplies provided from the MRWTP Phase Two Expansion project will allow the City to further utilize available surface water to meet water demands in lieu of using groundwater in the Modesto Subbasin.

The City will address overdraft conditions in accordance with the SGMA through the development of GSPs for the groundwater subbasins underlying the City's water service area. The GSPs will identify the activities required for the City to monitor and manage groundwater levels, water quality, groundwater quality degradation, and inelastic land surface subsidence.

#### 6.4.1.6 Historical Groundwater Pumping

The City's historical groundwater pumpage from 2011 through 2015, is summarized in Table 6-6. Average annual groundwater pumpage over the past five years has been approximately 32,904 AFA, which is below the City's established groundwater operational yield of 53,500 AFA. The City's historical groundwater supply was of sufficient quality and quantity to meet the City's water demands.

The general decrease in overall water use and groundwater pumpage in recent years is a direct result of water conservation by the City's water customers in response to the recent drought conditions, in addition to the City's installation of water meters, reduced leakage losses and after effects of the economic downturn. However, in 2014, groundwater pumpage increased over 2013 quantities to supplement reduced treated surface water deliveries from MID. In 2015, treated surface water supplies were again reduced, and groundwater pumpage was used to supply approximately two-thirds of the City's annual water supply.

**Table 6-6. Retail: Groundwater Volume Pumped (DWR Table 6-1 Retail)**

| Groundwater Type | Location or Basin Name               | 2011          | 2012          | 2013          | 2014          | 2015          |
|------------------|--------------------------------------|---------------|---------------|---------------|---------------|---------------|
| Alluvial Basin   | San Joaquin Valley Groundwater Basin | 34,897        | 31,380        | 29,773        | 36,415        | 32,058        |
| <b>TOTAL</b>     |                                      | <b>34,897</b> | <b>31,380</b> | <b>29,773</b> | <b>36,415</b> | <b>32,058</b> |

NOTES: Volumes are in AF. Historical groundwater volumes do not include production from Hickman and Waterford.

### 6.4.2 Groundwater Supply for MID

MID maintains approximately 93 groundwater wells that are used to supplement the surface water supply during dry years for use by MID’s agricultural customers. MID does not currently pump and deliver groundwater supply to urban suppliers as shown in Table 6-7, nor does it have plans to do so in future years.

**Table 6-7. Wholesale: Groundwater Volume Pumped (DWR Table 6-1 Wholesale)**

| <input checked="" type="checkbox"/> | Supplier does not pump groundwater.<br>The supplier will not complete the table below. |          |          |          |          |          |
|-------------------------------------|--|----------|----------|----------|----------|----------|
| Groundwater Type                    | Location or Basin Name   | 2011     | 2012     | 2013     | 2014     | 2015     |
| <b>TOTAL</b>                        |  | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> |

### 6.5 STORMWATER

In 1989, Congress passed amendments to the Clean Water Act requiring states to address the increasing problem of stormwater pollution entering storm drains. California requires a National Pollutant Discharge Elimination System (NPDES) permit to regulate stormwater discharges.

The City’s storm drain system has approximately 77 miles of storm drain lines and 20 pump stations. Stormwater discharges from the City drain to detention/retention basins, approximately 18 major outfalls to receiving waters (Tuolumne River or Dry Creek), MID laterals/drains, or rock wells (approximately 11,000). Approximately 40 percent of stormwater discharges to detention/retention basins, 20 percent to receiving waters (Tuolumne River or Dry Creek), 10 percent to MID laterals/drains, and 30 percent to rock wells.

Stormwater can be beneficially reused as a water supply source to meet local water demands. Beneficial reuses include blending with other water supplies for groundwater recharge, redirecting it into constructed wetlands or landscaping, and diverting it to a treatment facility for subsequent reuse. The City currently recharges some of its stormwater via rock wells, infiltration basins, and newly developed underground storage and recharge facilities with plans to further develop more of these passive recharge opportunities. The City has also teamed up with the County to develop a

Storm Water Resources Plan that will evaluate beneficial stormwater uses, and specifically, those that can augment groundwater supplies.

## 6.6 WASTEWATER AND RECYCLED WATER

### 6.6.1 Recycled Water Coordination

#### 6.6.1.1 Recycled Water Planning for the City

The cities of Modesto, Turlock and Ceres have historically worked together to identify regional opportunities for wastewater treatment and recycled water production. An example of a recent cooperative project is the North Valley Regional Recycled Water Program (NVRWP), an effort to regionalize recycled water use in Stanislaus County. As envisioned, the NVRWP could produce and deliver up to 16,800 AFA (15 MGD) of disinfected tertiary treated recycled water to western Stanislaus County by May 2018.<sup>7</sup> By 2045, NVRWP could deliver up to 59,900 AFA of tertiary treated recycled water. The source of recycled water includes treated wastewater from the cities of Modesto, Turlock and Ceres. As part of the project, the City of Turlock would install an additional 5.7 miles of conveyance pipeline to convey water directly from its Regional Water Quality Control Facility's tertiary treatment plant to NVRWP transmission pipe facilities, which would discharge to the Delta-Mendota Canal (DMC). The DMC would be used to convey the blended canal-recycled water to users in the west side of Stanislaus County.

A feasibility study was completed in 2005 to analyze opportunities for recycled water use in the region (Northern San Joaquin Valley Water Reclamation Project Feasibility Study (RMC, 2005))<sup>8</sup>. This feasibility study assessed recycled water markets, reviewed regulatory requirements, and developed and evaluated alternatives for regional wastewater treatment and recycled water use. As part of the study, stakeholder workshops were conducted to discuss and gain input on recycled water opportunities. Seventeen local communities and agencies were invited to participate in the workshops and nine cities and agencies participated.

This work has been further refined with completion of additional feasibility, alignment, and other studies in 2013 and 2015, and the City is currently moving forward with a project to supply tertiary treated recycled water to the Del Puerto Water District (DPWD), as well as other potential users<sup>9</sup> in western Stanislaus County, with the implementation of the NVRWP. DPWD is located along the west side of the San Joaquin Valley and extends from Vernalis to Santa Nella. Currently, DPWD's only source of water is through a contract with USBR for Central Valley Project (CVP) supply. Since the 1990s, DPWD has experienced reduction in CVP deliveries due to drought conditions and regulatory restrictions imposed on CVP operations. The geographic proximity of DPWD to the City's wastewater treatment facilities provides an opportunity for recycled water to supplement DPWD's existing water supply and improve water reliability. Although the NVRWP would not provide a potable water offset directly to the City's service area, the treated wastewater

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<sup>7</sup> The City of Turlock is anticipated to increase the delivery by 8,000 AFA (7 MGD) after 2019.

<sup>8</sup> Source: [https://www.modestogov.com/pwd/docs/reports/water/water\\_feasibility.pdf](https://www.modestogov.com/pwd/docs/reports/water/water_feasibility.pdf)

<sup>9</sup> Wildlife refuges downstream of the DMC have been identified as potential users.

would be used beneficially and would provide water supply reliability, public safety, enhanced property values, and increased educational opportunities. The City currently has a State Revolving Fund loan to construct the proposed NVRWP pipelines, pump stations, etc. from the City's Jennings Road Treatment Plant to the DMC, north of the City of Patterson.

#### 6.6.1.2 Recycled Water Planning for MID

MID is not directly involved with the treatment of wastewater or the distribution of recycled water and does not have plans to do so in the future.

#### 6.6.2 Wastewater Collection, Treatment, and Disposal

The City's wastewater service area is smaller than the City's water service area. The City of Modesto's wastewater treatment facilities serve the City's wastewater service area and a small northern portion of the City of Ceres (including Ceres (Walnut Manor)). The following sections discuss the wastewater collected and treated within the City's water service area either by the City or by other agencies.

##### 6.6.2.1 Wastewater Collected and Treated by the City

Influent to the City's wastewater treatment facilities consists primarily of domestic, commercial, industrial, food processing, and winery waste. Treatment of the City's raw wastewater occurs at two locations: Sutter Avenue Primary Treatment Plant (located within the City's water service area) and Jennings Road Treatment Plant (located outside the City's water service area). The Sutter Avenue Primary Treatment Plant provides pumping, screening, grit removal, flow measurement, primary clarification and sludge digestion. The primary effluent is then pumped approximately seven miles to the secondary treatment plant (the Jennings Road Treatment Plant) where it is treated further.

The Jennings Road Treatment Plant includes both secondary and tertiary treatment facilities. Secondary treatment includes biological treatment with fixed film reactors, recirculation, aerated recirculation, and oxidation ponds. The City currently disposes of the secondary treated effluent in two ways: (1) through irrigation of approximately 2,500 acres of ranch lands that the City owns, and (2) through seasonal discharge to the San Joaquin River, both of which are pursuant to NPDES Permit No. CA0079103. However, when physical or regulatory constraints prevent land application or discharge of secondary effluent, the effluent is stored on-site. Discharge of secondary effluent and cannery waste<sup>10</sup> to City-owned ranch lands is limited by organic loading limitations of the NPDES permit, allowable pasture irrigation rates (5 AFA per acre), and available acreage. Discharge of secondary effluent to the San Joaquin River between October 1 and May 31 is limited by a dilution requirement of 20 parts river water to one-part secondary effluent.

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<sup>10</sup> Historically, about 20 MGD of cannery wastewater with high concentrations of organic vegetable solids were sent to the primary treatment plant, causing the treatment plant to operate inefficiently. To address this problem, in the late 1990s, the Cannery Segregation Project was implemented such that now, up to 40 MGD of wastewater from seasonal canneries is segregated and bypasses treatment. These cannery discharges are applied directly to City-owned ranch lands as a soil supplement.

In 2010, the Jennings Road Treatment Plant phased in tertiary treatment with the completion of Phase 1A of its Tertiary Treatment Project, providing up to 2.3 MGD of tertiary treated water. The tertiary treatment process includes oxidation, de-nitrification, membrane filtration and ultraviolet disinfection facilities. Phase 2 of the Tertiary Treatment Project was completed in late 2015 and added another 12.6 MGD of tertiary treatment capacity, allowing for compliance with the City's NPDES Permit and permitting year-round discharge to the San Joaquin River. As discussed above, the City has plans to supply tertiary treated recycled water to the DPWD, as well as other potential users in western Stanislaus County.

#### 6.6.2.2 Wastewater Collected and Treated by Other Agencies

The City's water service areas that do not receive wastewater services from the City of Modesto include Salida, Grayson, Del Rio, and portions of Turlock. The wastewater collected and treated by other wastewater agencies are described below.

The Salida Sanitary District provides wastewater collection, treatment, and disposal for the unincorporated community of Salida and various customers located outside its boundaries including BMC West Lumber Company, the former Modesto Tobacco and Candy, Vella Middle School, Flory Industries, the former Shell Lab site, and Gregori High School. The Salida Sanitary District's operates its wastewater treatment plant on the northern edge of Stanislaus County, just south of the Stanislaus River (6200 Pirrone Road, Salida). The Salida Sanitary District's Wastewater Treatment Plant currently processes approximately 1.2 MGD, which represents half of the plant's total capacity of 2.4 MGD.

The Grayson Community Services District provides street lighting and wastewater (sewer) services to the community of Grayson. The Grayson Community Services District's wastewater collection and treatment system has a designed flow capacity of 100,000 gallons per day. Any growth in the area would require significant upgrades to the system to increase the treatment capacity.

Wastewater collection and treatment in Del Rio is provided by both private septic systems and small packaged wastewater treatment plants. Generally, the newer areas on the east and northwest as well as the Country Club and nearby condominiums are likely to be served by packaged plants and the older larger homes are served by private septic systems.

The Turlock Regional Water Quality Control Facility (RWQCF) receives wastewater from the City of Turlock, the Community Service Districts of Keyes and Denair and up to 2 MGD of primary treated wastewater from the City of Ceres. The RWQCF is designed to treat an average of 20 MGD and is currently treating an average influent flow of 10.3 MGD. The raw wastewater received at the Turlock RWQCF is a combination of domestic and industrial wastewater flows. The RWQCF produces disinfected tertiary treated water that meets Title 22 standards for unrestricted use. Final effluent from the RWQCF that is not recycled is discharged to the San Joaquin River. Effluent flows by pipeline to a pump station for pumping via the Harding Drain Bypass Pipeline, with subsequent discharge through a 36-inch diameter outfall directly into the San Joaquin River.

Table 6-8 summarizes the information on the collection of wastewater generated within the City’s water service area in 2015.

**Table 6-8. Retail: Wastewater Collected Within Service Area in 2015 (DWR Table 6-2 Retail)**

| Wastewater Collection  |   |  | Recipient of Collected Wastewater                                  |   |                                   |  |
|--|---|--|--|---|-----------------------------------|--|
| Name of Wastewater Collection Agency                         | Wastewater Volume Metered or Estimated? | Volume of Wastewater Collected from UWMP Service Area 2015 | Name of Wastewater Treatment Agency Receiving Collected Wastewater | Treatment Plant Name                            | Is WWTP Located Within UWMP Area? | Is WWTP Operation Contracted to a Third Party? <i>(optional)</i> |
| City of Modesto  | Metered                                 | 24,152   | City of Modesto  | Sutter Avenue Primary Treatment Plant           | Yes                               |  |
| City of Modesto  | Metered                                 | 2,995  | City of Modesto  | Jennings Road Treatment Plant                   | No                                |  |
| Salida Sanitary Sewer District                               | Metered                                 | 1,283  | Salida Sanitary Sewer District                                     | Salida Sanitary Treatment Plant                 | No                                |  |
| Grayson Community Services District                          | Estimated                               | 86   | Grayson Community Services District                                | Grayson WWTP                                    | No                                |  |
| Del Rio  | Estimated                               | 92   | Septic systems and Package plant                                   | N/A   | No                                |  |
| City of Turlock  | Estimated                               | 101  | City of Turlock  | Turlock Regional Water Quality Control Facility | No                                |  |
| <b>Total Wastewater Collected from Service Area in 2015:</b> |   | 28,709   |  |   |                                   |  |

NOTES: Volumes are in AF.

Table 6-9 identifies the wastewater treated and disposed of within the City’s water service area in 2015. As discussed above, only the City’s Sutter Avenue Primary Treatment Plant is located within the City’s water service area and provides primary treatment only. The primary effluent from the Sutter Avenue Primary Treatment Plant is pumped approximately to the Jennings Road Treatment Plant, which is located outside the City’s water service area.

**Table 6-9. Retail: Wastewater Treatment and Discharge Within Service Area in 2015 (DWR Table 6-3 Retail)**

| Wastewater Treatment Plant Name                       | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number (optional) | Method of Disposal | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level          | 2015 volumes       |                               |                              |                                  |
|---|---------------------------------------|--------------------------------|---|--------------------|--|--------------------------|--------------------|-------------------------------|------------------------------|----------------------------------|
|   |                                       |                                |   |                    |  |                          | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area |
| City of Modesto Sutter Avenue Primary Treatment Plant | N/A                                   | N/A                            |   | Other              | No   | Secondary, Undisinfected | 24,152             | 0                             | 0                            | 0                                |
| <b>Total</b>  |                                       |                                |   |                    |  |                          | <b>24,152</b>      | <b>0</b>                      | <b>0</b>                     | <b>0</b>                         |

NOTES: Volumes are in AF. The Sutter Avenue Primary Treatment Plant provides primary treatment only.

### 6.6.2.3 Wastewater in MID

MID is not directly involved with the treatment and discharge of wastewater and is therefore not required to complete DWR Table 6-3 (Wholesale).

### 6.6.3 Recycled Water System

As discussed above, the City does not currently operate a recycled water system as secondary treated effluent is generally used to directly irrigate City-owned ranch lands or discharged to the San Joaquin River. MID also does not deliver recycled water supply. As discussed above, the City plans to deliver tertiary treated recycled water to DPWD’s service area and to other potential users in western Stanislaus County as part of the NVRWP. However, the City and MID do not have plans to develop recycled water systems within their respective water service boundaries in the future.

### 6.6.4 Recycled Water Beneficial Uses

Recycled water is recognized as a beneficial water supply due to its many advantages including:

- Providing a reliable water source that is consistently available regardless of droughts or climate change;
- Offsetting potable water for other uses; and
- Diversifying agencies’ and cities’ water supply portfolios.

As discussed above, the City currently uses recycled water for agricultural irrigation on City-owned ranch lands located outside of its water service area. Therefore, there is no existing or planned beneficial use of recycled water within the City’s water service area as shown in Table 6-10.

MID is not directly involved with the distribution of recycled water and also does not plan to do so in the future, and is therefore not required to complete DWR Table 6-4 (Wholesale).

**Table 6-10. Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4 Retail)**

| <input checked="" type="checkbox"/> Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below. |                                  |                    |      |      |      |      |      |            |
|--|----------------------------------|--------------------|------|------|------|------|------|------------|
| Name of Agency Producing (Treating) the Recycled Water:  |                                  |                    |      |      |      |      |      |            |
| Name of Agency Operating the Recycled Water Distribution System:   |                                  |                    |      |      |      |      |      |            |
| Supplemental Water Added in 2015   |                                  |                    |      |      |      |      |      |            |
| Source of 2015 Supplemental Water  |                                  |                    |      |      |      |      |      |            |
| Beneficial Use Type  | General Description of 2015 Uses | Level of Treatment | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 (opt) |
|  |                                  | <b>Total:</b>      | 0    | 0    | 0    | 0    | 0    | 0          |

The 2015 projected estimates of recycled water use from the 2010 UWMP is compared to the actual 2015 recycled water use in Table 6-11. The 2010 UWMP accounted for the projected recycled water use on City-owned ranch lands located outside the City’s water service area. The City has continued to provide recycled water to these ranch lands. However, because no recycled water was actually used within the City’s water service area, Table 6-11 indicates zero recycled water use in 2015.

MID is not directly involved with the distribution of recycled water as shown in Table 6-12.

**Table 6-11. Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (DWR Table 6-5 Retail)**

| Use Type                | 2010 Projection for 2015 | 2015 Actual Use |
|-------------------------|--------------------------|-----------------|
| Agricultural irrigation | 9,100                    | 0               |
| <b>Total</b>            | 9,100                    | 0               |

NOTES: Volumes are in AF. There was no recycled water use within the City's water service area in 2015.

**Table 6-12. Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (DWR Table 6-5 Wholesale)**

| <input checked="" type="checkbox"/> Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015. The wholesale supplier will not complete the table below. |                          |                 |
|--|--------------------------|-----------------|
| Name of Receiving Supplier or Direct Use by Wholesaler   | 2010 Projection for 2015 | 2015 actual use |
| None   | 0                        | 0               |
| <b>Total</b>   | 0                        | 0               |



Other potential beneficial uses of recycled water in the City's water service area include the following:

- Water sale to agricultural users,
- Environmental use; and
- Groundwater recharge.

These beneficial uses were not identified previously in Table 6-10 because they either currently have significant implementation constraints or would not provide beneficial use directly to the City's water service area.

#### 6.6.4.1 Water Sale to Agricultural Users

The City does not expect to expand recycled water use for agricultural irrigation within its water service area primarily due to the availability, reliability, and low cost of irrigation water available to water users from both MID and TID. As discussed above, the City is currently moving forward with a project to supply tertiary treated recycled water to the DPWD, as well as other potential users in western Stanislaus County, with the implementation of the NVRWP. Although this project would not provide a potable water offset directly to the City's water service area, the treated wastewater would be used beneficially.

#### 6.6.4.2 Environmental Use

Potential opportunities for environmental uses include stream flow augmentation, wildlife habitat restoration, wetland enhancement and other related environmental purposes. One potential environmental use identified in the 2005 recycled water feasibility study is augmentation of summer flow in the San Joaquin River with disinfected tertiary treated recycled water. This could enhance habitat in the San Joaquin River and the Delta during the summer months. Environmental uses of recycled water would require evaluation in future studies to assess the potential impacts to local groundwater supplies, agricultural lands, and other environmental habitats.

Another potential opportunity identified for environmental enhancement is potential delivery of recycled water to the San Joaquin River National Wildlife Refuge (SJRNR) for wetlands enhancement. The U.S. Fish and Wildlife Service (USFWS) has a program to restore historic wetlands that are located adjacent to the San Joaquin River as land is acquired. The SJRNR is located approximately 10 miles west of the City of Modesto and is part of the Pacific Flyway that supports migratory waterfowl. Additional coordination with the USFWS would be necessary to identify opportunities for recycled water use in the SJRNR.

Recycled water could also be used to develop constructed wetlands to provide habitat for endangered species and other wildlife. Constructing/developing wetlands in the Modesto area would probably require conversion of agricultural land or modification of other land uses.

Recycled water quality is a significant consideration for environmental use since pharmaceuticals, trace elements, pesticides, and other constituents could potentially result in adverse impacts to aquatic and other wetland species. The quality of recycled water required for environmental use is dependent on the specific uses of the water (i.e., treatment wetlands have different needs than

stream flow augmentation projects). Treatment requirements and water quality goals should be evaluated in the future as specific environmental projects are identified.

#### 6.6.4.3 Groundwater Recharge

Using municipal recycled water as a recharge source for groundwater subbasins used for M&I water supply purposes is an approved practice in California. Water Factory 21 in Orange County and the Montebello Forebay project operated by the Los Angeles County Sanitation District have been in operation since the late 1970's, recharging over 50,000 AFA to the local groundwater subbasins. However, advanced treatment technologies (reverse osmosis (RO), ultraviolet (UV) disinfection, etc.) are necessary to remove pathogens, organics, trace elements, and other impurities prior to recharge. These technologies are expensive to construct and operate, and typically reduce the project yield by as much as 25 percent (due to residuals and brine byproduct). Brine byproduct disposal would be an additional challenge for a groundwater recharge project. It is unlikely that the brine byproduct would be an allowable discharge to any inland surface water. Evaporation/crystallization process, blending and use for irrigation, or some other disposal process would need to be implemented in conjunction with the RO facilities.

Groundwater recharge using recycled water can be accomplished by percolation or direct injection. Recharge could be practiced year round or seasonally, and could be implemented with other potential recycled water uses. With recharge, recycled water would commingle with groundwater and be transported via the aquifer system to existing wells. Percolation basins would be located in areas with high recharge potential. Injection wells could also be constructed, but would need to be spaced to reduce groundwater mounding and would require a distribution header system.

Groundwater is a major potable water supply component for the City and surrounding communities. While the combined operational yield of the Modesto and Turlock subbasins is currently unknown, a groundwater recharge project could supplement and increase the annual groundwater basin operational yield. Water quality constituents of concern in any domestic groundwater supply include salinity, nitrates, certain trace elements, hardness, iron, and manganese. The use of reverse osmosis for water treatment prior to recharge would probably enhance basin groundwater quality.

Regulatory requirements governing groundwater recharge differ based on factors such as method of recharge, effluent quality, groundwater depth, soil percolation capacity, and groundwater basin volume. All of these variables would need to be defined before a recharge project could be implemented. The coliform concentration of the City's secondary treated recycled water exceeds the maximum concentration allowed to recharge through settling basins. Tertiary treated recycled water would be necessary for direct groundwater injection.

#### 6.6.5 Actions to Encourage and Optimize Future Recycled Water Use

The 2005 recycled water feasibility study identified a multi-phased implementation strategy for recycled water, with sale to agricultural users outside of the MID and TID service areas as the most cost-effective recycled water use opportunity, which the City has been pursuing as a near-term recycled water strategy. Since completion of the 2005 study, further feasibility analysis has been performed, and the concept has been refined to focus on delivery options to DPWD and

other potential users in western Stanislaus County. The City is currently in the process of constructing the proposed NVRWP pipelines, pump stations, etc. from the City’s Jennings Road Treatment Plant to the DMC, north of the City of Patterson.

Although public education of the benefits of recycled water use and beautification of areas using recycled water supplies are important components to develop positive public perception surrounding recycled water and encourage widespread recycled water usage, due to the qualitative nature of these measures, it is not possible to project the quantity of recycled water usage that will result from implementation of these measures.

On a long-term basis, the City will continue to explore regional wastewater treatment and recycled water use opportunities. However, the City’s currently identified actions to pursue delivery of recycled water to DPWD and other potential users in western Stanislaus County does not provide a potable water offset in the City’s water service area and is therefore not included in Table 6-13.

**Table 6-13. Retail: Methods to Expand Future Recycled Water Use (DWR Table 6-6 Retail)**

| <input checked="" type="checkbox"/> | Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation. |                             |   |
|-------------------------------------|---|-----------------------------|---|
| Page 6-20                           | Provide page location of narrative in UWMP  |                             |   |
| Name of Action                      | Description   | Planned Implementation Year | Expected Increase in Recycled Water Use |
| <b>Total</b>                        |   |                             | <b>0</b>                                |

### 6.7 DESALINATED WATER OPPORTUNITIES

Due to the significant infrastructure investment required to convey seawater for desalination, the lack of proximate brackish supply sources and the depth to saline groundwater, desalination is not currently a viable water supply option for the City or MID.

### 6.8 EXCHANGES OR TRANSFERS

This section describes the City and MID’s opportunities for exchanges or transfers of water on a short-term or long-term basis. Water exchanges are typically water delivered by one water user to another water user, with the receiving water user providing water in return at a specified time or when the conditions of the parties’ agreements are met. The CWC defines water transfers as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to transfer, sale, lease, or exchange of water or water rights. Temporary water transfers have a duration of one year or less, and long-term water transfers have a duration of more than one year.

### 6.8.1 Exchange or Transfer Opportunities for the City

During supply shortage years, MID’s treated surface water supply deliveries to the City may be reduced in equal proportion to deliveries for agricultural customers. Although never utilized, the City has the option of delivering groundwater to MID's irrigation canal system in exchange for an equal amount of raw surface water to be treated at the MRWTP during dry years. The City’s exchange or transfer opportunities are shown in Table 6-14.

**Table 6-14. Exchange or Transfer Opportunities for the City**

| Transfer Agency | Transfer or Exchange | Short-term | Proposed Quantities | Long-term | Proposed Quantities |
|-----------------|----------------------|------------|---------------------|-----------|---------------------|
| MID             | Transfer or Exchange | Yes        | TBD                 | Yes       | TBD                 |
| Total           |                      |            | TBD                 |           | TBD                 |

### 6.8.2 Exchange or Transfer Opportunities for MID

During supply shortage years, MID surface water supplies may be reduced. MID may execute exchange agreements with the City, which would allow the City to deliver groundwater to MID's irrigation canal system in exchange for an equal amount of raw surface water to be treated at the MRWTP during dry years. In general, MID has not sought exchange or transfer opportunities. MID’s exchange or transfer opportunities are summarized in Table 6-15.

**Table 6-15. Exchange or Transfer Opportunities for MID**

| Transfer Agency | Transfer or Exchange | Short-term | Proposed Quantities | Long-term | Proposed Quantities |
|-----------------|----------------------|------------|---------------------|-----------|---------------------|
| City of Modesto | Exchange             | Yes        | TBD                 | No        | TBD                 |
| Total           |                      |            | TBD                 |           | TBD                 |

## 6.9 FUTURE WATER PROJECTS

The City’s treated surface water supply from MID and the City’s groundwater supply are the key components of the City’s water supply portfolio. This section describes potential future water supply projects that the City and MID may implement to increase water supply for average, single-dry, and multiple dry years. Because the City is projected to have sufficient supplies to meet future water demands as documented in the City’s Water Master Plan (2016), the need for and timing of potential water supply projects have not been determined. Therefore, these potential future water supply projects are not currently included in the City and MID’s future water supply portfolio, and DWR Table 6-7 (Retail) and Table 6-7 (Wholesale) have not been completed as shown below in Tables 6-16 and 6-17.

**Table 6-16. Retail: Expected Future Water Supply Projects or Programs (DWR Table 6-7 Retail)**

|                                     |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. |
|-------------------------------------|---|

**Table 6-17. Wholesale: Expected Future Water Supply Projects or Programs (DWR Table 6-7 Wholesale)**

|                                     |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. |
|-------------------------------------|---|

### 6.9.1 Potential Additional Surface Water Supply Options

Treated surface water purchased from MID is a key component of the City's existing water supply portfolio. A MRWTP Phase Three Expansion Project may be possible in the future if there is a sizeable future conversion of agricultural land to urban uses (requiring an accompanying change in water rights from agricultural to M&I uses), which would allow for a corresponding redistribution of MID's existing surface water rights. However, at this time, this project is speculative, and the need for and timing of this project has not yet been determined.

### 6.9.2 Future Groundwater Supply Considerations

Groundwater is a key component of the City's existing water supply portfolio. The following sections describe key future groundwater supply options, including:

- Wellhead treatment systems; and
- Aquifer Storage and Recovery (ASR) Program consisting of injecting, storing, and recovering treated surface water from the groundwater aquifer beneath the City.

#### 6.9.2.1 Wellhead Treatment Evaluation

To help address the City's vulnerability to groundwater quality issues, a wellhead treatment evaluation was performed as part of the City's Water Master Plan project to: (1) evaluate the range of wellhead treatment options available for removal of several specific contaminants of concern (hexavalent chromium, nitrate, manganese, strontium and uranium); and (2) recommend which processes would best suit wellhead treatment applications at the City's wells. The best technology for wellhead treatment depends upon both the target contaminant and the ambient water quality of the well water. A series of recommended treatment approaches were developed and are summarized in Table 6-18.

**Table 6-18. Summary of Wellhead Treatment Recommendations by Contaminant Type<sup>(a)</sup>**

| Contaminant                             | Recommended Process(es)                                 | Rationale  | Additional Notes  |
|---|---|--|---|
| Hexavalent Chromium (with low nitrate)  | Strong-base anion (SBA) exchange                        | Advances in brine minimization have greatly reduced waste management costs for at least one technology   | If SBA or biological treatment cannot be used alone, biofiltration followed by SBA may be warranted to minimize expensive ion exchange brine disposal requirements. |
| Hexavalent Chromium (with high nitrate) | Biological treatment (if proven), anion exchange if not | Biological treatment is proven at bench-scale, pilot testing in progress   |   |
| Manganese                               | Greensand filtration                                    | Simple to operate, low-cost alternative  | Permanganate is a more effective oxidant but use of free chlorine may be simpler as it can also serve as a disinfectant residual post-treatment.                    |
| Nitrate                                 | Biological filtration                                   | Lowest-cost, simple operation, eco-friendly  | A comparatively new technology but conditionally approved by DDW and does not produce a brine waste.  |
| Uranium                                 | Anion exchange with off-site regeneration               | Long operating life if the nitrate concentration is low, no technically enhanced naturally occurring radioactive material waste production on-site | If nitrate is relatively high (so violation of the MCL is likely at breakthrough), pretreatment with biofiltration should be considered.                            |
| Strontium                               | Cation exchange and/or lime softening                   | Both proven efficacious  | Dataset is limited. Cations like calcium can be a big problem for strontium removal with ion exchange so pretreatment may be warranted.                             |

<sup>(a)</sup> Source: Chapter 5, City of Modesto Water Master Plan (2016), West Yost Associates.

As the City moves forward with treatment at one or more of its groundwater wells, site-specific details like water quality, available footprint, and access to waste disposal options may shift the preferred technology choice. Also, as technologies develop, new (and/or better proven) options may become available that warrant further consideration.

### 6.9.2.2 ASR Program

The City’s Water Master Plan project also included a conceptual-level evaluation for ASR within the groundwater basin underlying the City’s contiguous water service area. The focus of this evaluation was to review existing data on the City’s wells and groundwater basin hydrogeologic and geochemical characteristics to determine the conceptual feasibility of injecting, storing, and recovering treated surface water within the groundwater aquifer beneath the City.

ASR is a form of managed aquifer recharge that involves the seasonal banking of water in an aquifer during times when excess water is available (typically winter and spring), and subsequent recovery of the water from the aquifer when needed (typically fall and summer, and/or during drought periods). ASR utilizes dual-purpose injection/recovery wells for the injection of treated, potable water for storage, and the subsequent recovery of this previously stored water by pumping. The advantage of ASR technology is that it allows recharge to be applied in those geographic areas or aquifer zones with the most need, or where available groundwater storage space is the greatest. In addition, ASR sites require minimal land use area, so they can be more easily located than spreading basins or other recharge facilities.

Conceptually, treated surface water purchased on a wholesale basis from MID could be used when seasonally available surplus supply is available to develop an ASR program for the City. The ASR program, if determined to be feasible, could provide the City with the following benefits: system peaking, enhanced groundwater operational yield, and improved groundwater quality.

A screening-level analysis of the City's existing wells was performed to identify existing City wells with the highest initial estimated injection capacities. Three wells were identified as potential candidates for ASR testing:

- Well 65 in the Unconfined Aquifer
- Well 38 in the Confined Area – Shallow Aquifer
- Well 33 in the Confined Area - Shallow/Deep Aquifers

The overall conclusion is that an ASR Program is viable in the groundwater basin underlying the City. It is recommended that the City move forward with an ASR demonstration project to empirically verify the conclusions of the initial study and to develop site-specific data regarding the effectiveness, impacts, and economics of ASR. These test program data would then serve as the basis for evaluating, planning, and permitting a full-scale ASR Program within the City.

## 6.10 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

### 6.10.1 Existing and Planned Sources of Water for the City

Total annual water production has generally decreased since the early 2000s, a direct result of decreased water demands resulting from the recent economic downturn, water conservation in response to recent drought conditions, the City's installation of water meters, and reduced leakage losses. Water production in both 2014 and 2015 was particularly low in response to increased water conservation due to severe drought conditions. Overall, annual surface water deliveries to the City have been relatively consistent, with groundwater pumpage varying as needed to meet demands. However, in 2014 and 2015, there were significant reductions in treated surface water deliveries from MID, and the City used its groundwater supply to meet water demands.

## Chapter 6 System Supplies



The City's annual treated surface water purchases from MID and groundwater pumpage in 2015 to serve the City's contiguous and outlying service areas are summarized in Table 6-19.

**Table 6-19. Retail: Water Supplies – Actual (DWR Table 6-8 Retail)**

| Water Supply                | Additional Detail on Water Supply | 2015          |                |                                      |
|-----------------------------|-----------------------------------|---------------|----------------|--------------------------------------|
|                             |                                   | Actual Volume | Water Quality  | Total Right or Safe Yield (optional) |
| Purchased or Imported Water | Purchases from MID                | 15,401        | Drinking Water |                                      |
| Groundwater                 |                                   | 32,058        | Drinking Water |                                      |
| <b>Total</b>                |                                   | <b>47,459</b> |                | <b>0</b>                             |

NOTES: Volumes are in AF. Does not include supplies for Hickman and Waterford.

Table 6-20 summarizes the future projected water supplies for the City. The City plans to maximize the use of available treated surface water supplies purchased from MID including the MRWTP Phase Two Expansion and supplement with its available groundwater supply to meet projected water demands. It should be noted that the increases in treated surface water supplies to the City are only possible to the extent that agricultural land has been converted to urban uses, and are within the amount allowed in the transfer permit.

**Table 6-20. Retail: Water Supplies – Projected (DWR Table 6-9 Retail)**

| Water Supply                | Additional Detail on Water Supply | Projected Water Supply<br><i>Report To the Extent Practicable</i> |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |
|-----------------------------|-----------------------------------|---|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|
|                             |                                   | 2020  |                                      | 2025                        |                                      | 2030                        |                                      | 2035                        |                                      | 2040 (opt)                  |                                      |
|                             |                                   | Reasonably Available Volume                                       | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Purchased or Imported Water | Purchases from MID                | 44,800  |                                      | 48,533                      |                                      | 52,267                      |                                      | 56,000                      |                                      | 59,733                      |                                      |
| Groundwater                 |                                   | 24,666  | 53,500                               | 26,371                      | 53,500                               | 28,075                      | 53,500                               | 29,780                      | 53,500                               | 31,485                      | 53,500                               |
| <b>Total</b>                |                                   | <b>69,466</b>   | <b>53,500</b>                        | <b>74,904</b>               | <b>53,500</b>                        | <b>80,342</b>               | <b>53,500</b>                        | <b>85,780</b>               | <b>53,500</b>                        | <b>91,218</b>               | <b>53,500</b>                        |

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).



**6.10.2 Existing and Planned Sources of Water for MID**

MID’s annual treated surface water supplies delivered to the City in 2015 are summarized in Table 6-21.

**Table 6-21. Wholesale: Water Supplies – Actual (DWR Table 6-8 Wholesale)**

| Water Supply  | Additional Detail on Water Supply | 2015          |                |                                      |
|---------------|-----------------------------------|---------------|----------------|--------------------------------------|
|               |                                   | Actual Volume | Water Quality  | Total Right or Safe Yield (optional) |
| Surface water | Tuolumne River                    | 15,432        | Drinking Water |                                      |
| <b>Total</b>  |                                   | <b>15,432</b> |                | <b>0</b>                             |

NOTES: Volumes are in AF.

Table 6-22 summarizes the future projected water supplies for MID. As discussed above, the MRWTP Phase Two Expansion project was completed in May 2016, and will provide up to an additional 30 MGD of treated surface water supply for a total annual average supply of up to 60 MGD (67,200 AFA) by 2050.<sup>11</sup> The actual volume and timing of available supply from the MRWTP Phase Two Expansion project will be determined based on the amount of agricultural land converted to urban uses.

**Table 6-22. Wholesale: Water Supplies – Projected (DWR Table 6-9 Wholesale)**

| Water Supply  | Additional Detail on Water Supply | Projected Water Supply<br>Report To the Extent Practicable |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |
|---------------|-----------------------------------|--|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|
|               |                                   | 2020   |                                      | 2025                        |                                      | 2030                        |                                      | 2035                        |                                      | 2040 (opt)                  |                                      |
|               |                                   | Reasonably Available Volume                                | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Surface water |                                   | 44,800   |                                      | 48,533                      |                                      | 52,267                      |                                      | 56,000                      |                                      | 59,733                      |                                      |
| <b>Total</b>  |                                   | <b>44,800</b>  | <b>0</b>                             | <b>48,533</b>               | <b>0</b>                             | <b>52,267</b>               | <b>0</b>                             | <b>56,000</b>               | <b>0</b>                             | <b>59,733</b>               | <b>0</b>                             |

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).

**6.11 CLIMATE CHANGE IMPACTS TO SUPPLY**

An extensive evaluation of the impacts of climate change is included the East Stanislaus Integrated Regional Water Management (ESIRWM) Plan (December 2013). The City of Modesto is included in the East Stanislaus Regional Water Management Partnership (ESRWMP), the official Regional

<sup>11</sup> The actual supply available depends on the amount of agricultural land converted to urban uses. Additional 10 MGD is assumed to be available by 2020, gradually increasing to an additional 30 MGD by 2050 (buildout).

Water Management Group for the region, along with the cities of Hughson, Ceres and Turlock. Key findings from the climate change evaluation are summarized below.

There is mounting scientific evidence that global climate conditions are changing and will continue to change as a result of the continued build-up of greenhouse gases (GHGs) in the Earth's atmosphere and other issues. Changes in climate can affect municipal water supplies through modifications in the timing, amount, and form of precipitation, as well as water demands and the quality of surface runoff. These changes can affect all elements of water supply systems, from watersheds to reservoirs, conveyance systems, and treatment plants. Planning for and adapting to the anticipated changes in climate will be essential to ensure water supply reliability for all users and to protect sensitive infrastructure against potentially more frequent and extreme precipitation and wildfire events.

The ESIRWM planning region lies within the San Joaquin River Hydrologic Region and contains the Stanislaus, Tuolumne, Merced and San Joaquin Rivers, and Dry Creek. The Stanislaus, Tuolumne and Merced Rivers are all tributaries to the San Joaquin River, with the Tuolumne River having the largest watershed in the San Joaquin River system. At present, all major tributaries to the San Joaquin River are being studied with respect to anticipated impacts from climate change. Studies currently underway include:

- Changes in snow cover patterns in the Sierra Nevada (University of Washington);
- The role of atmospheric rivers in extreme events in the Sierra Nevada (USGS);
- Impacts of climate changes on soil properties and habitats in the Sierra Nevada (UC-Merced and USGS); and
- Study of the effects of climate change on hydrology and stream temperatures in the Merced and Tuolumne River watersheds (Santa Clara University).

In general, these studies are multi-year endeavors and are either in progress or have yielded data that are currently being evaluated. While preliminary study results appear to support other climate change impact observations and modeling simulations, the final published conclusions of these studies are, for the most part, not currently available.

Climate change is adding new uncertainties to already existing challenges in water resources planning within the ESIRWM planning region because the water supply portfolio in the region is not widely-diversified. Water supplies are derived from multiple subbasins of the San Joaquin Valley Groundwater Basin and primarily from the Tuolumne River. Climate change will impact groundwater and surface water differently, but the region's vulnerabilities are the same regardless of the source:

- Reduced surface water availability;
- Reduced water supply reliability as a result of reduced groundwater recharge and runoff;
- Potential increase in groundwater overdraft;
- Declining water quality;

- Loss of riparian habitat, wetlands and other sensitive natural communities; and
- Reduced hydroelectric generation capacity.

Considering the amount of uncertainty associated with climate change projections, a prudent approach to addressing climate change incorporates a combination of adaptation and mitigation strategies. Climate adaptation includes strategies (policies, programs or other actions) that bolster community resilience in the face of unavoidable climate impacts, where mitigation strategies include best management practices (BMPs) or other measures that are taken to reduce GHG emissions.

The Proposition 84 IRWM Guidelines require consideration of the California Water Plan (CWP) resource management strategies (RMSs) in identifying projects and water management approaches for the region. RMSs are being considered in the ESIRWM planning process to meet the region's objectives. Application of various RMSs diversifies water management approaches, and many of the RMSs apply to climate change adaptation and mitigation. Categories of applicable RMSs include:

- Reduce Water Demand
- Improve Operational Efficiency and Transfers
- Increase Water Supply
- Improve Water Quality
- Urban Runoff Management
- Practice Resource Stewardship
- Improve Flood Management
- Other Strategies

For the City, the implementation of its overall water conservation program, particularly the completion of the residential metering program, will help to reduce water demands, and also conserve energy as a result of decreased water treatment, conveyance and pumping requirements. The City's compliance with SB X7-7 and its interim and final per capita water use targets will also ensure continued water conservation and energy conservation in the future. The City's increased use of surface water supplies from MRWTP Phase Two Expansion will help to further diversify the City's water supplies and enhance the City's water supply reliability to "adapt" to the changing hydrologic conditions associated with climate change.

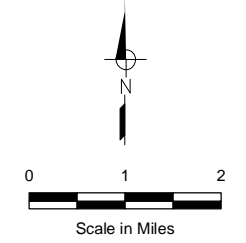
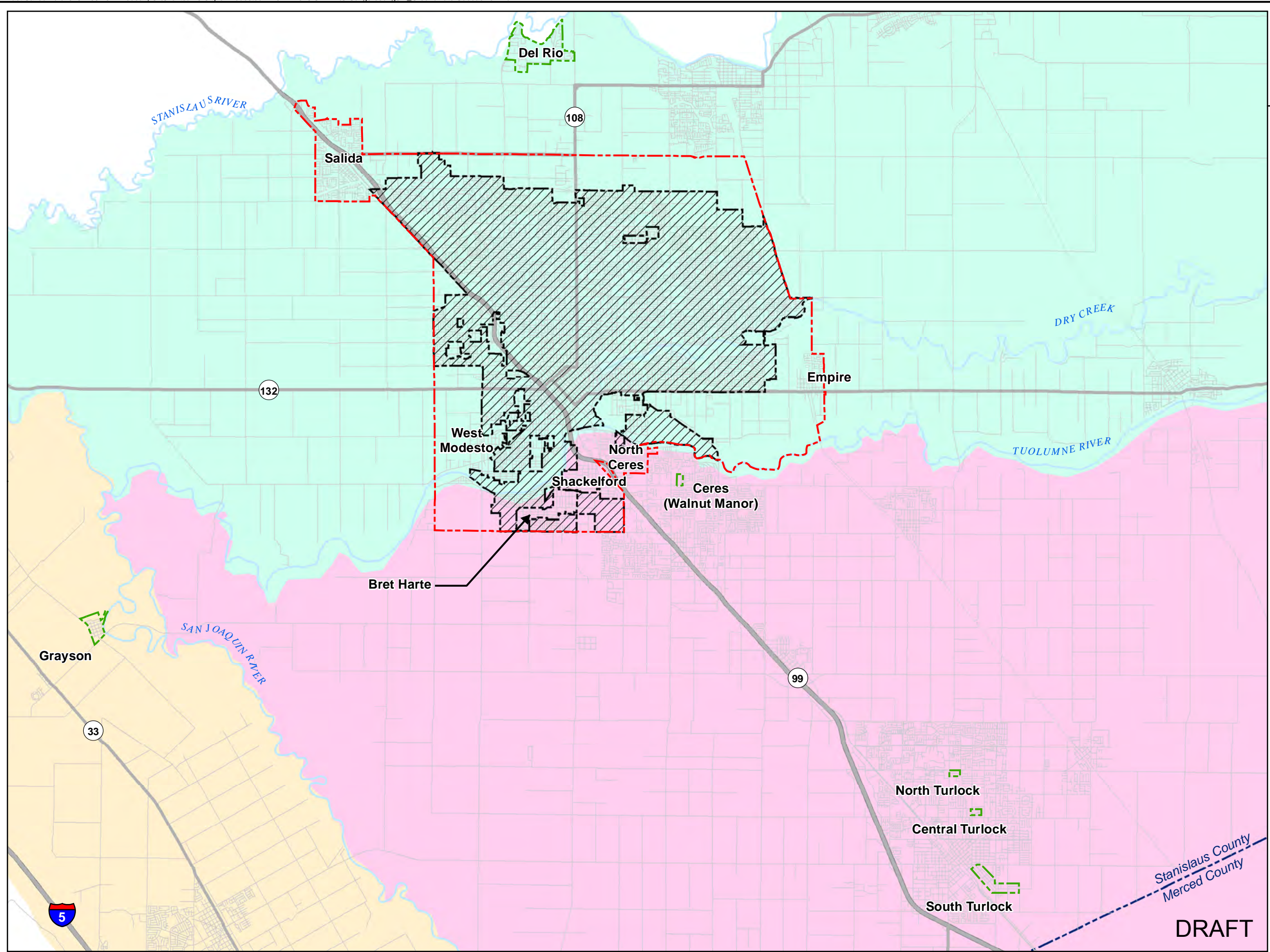
As described in MID's 2015 Agricultural Water Management Plan Update, MID is committed to (1) monitoring key indicators of climate change that affect the hydrology of the Tuolumne River watershed and the growing conditions in MID's irrigation service area and (2) adapting its water management practices to respond to changes as they become evident. In addition to adaptive management, implementation of the water conservation initiatives currently underway at MID will help MID and its agricultural water users prepare for the potential impacts of climate change by improving operational control. Improving operational control will enable MID to exercise adaptive management measures should they become necessary.

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**FIGURE 6-1**

**City of Modesto / MID  
2015 UWMP**

**GROUNDWATER  
SUBBASINS**



- Notes**
1. Sphere of influence boundary obtained from the City on 11/6/2014.
  2. The City's contiguous service area is co-terminus with the City's SOI boundary except for the Salida and North Ceres areas.
  3. Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford.

**LEGEND**

- Groundwater Subbasins**
- Delta-Mendota Subbasin
  - Modesto Subbasin
  - Turlock Subbasin
  - Contiguous Service Area
  - Outlying Service Area
  - City Limits

Stanislaus County  
Merced County

**DRAFT**



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## CHAPTER 7

# Water Supply Reliability Assessment



This chapter describes the long-term reliability and vulnerability of the City and MID's water supplies. The City and MID's current and proposed water management tools to address the reliability of water supplies are also addressed.

### 7.1 CONSTRAINTS ON WATER SOURCES

As described in *Chapter 6 System Supplies*, the City relies on two primary sources of water supplies: wholesale treated Tuolumne River surface water deliveries from MID and local groundwater pumping. The following is a general discussion regarding the constraints on the City and MID's water supplies and the associated management strategies that have been employed to address these constraints.

In general, the City and MID's water supplies are most vulnerable to climatic variability and chemical contamination (due to natural and/or man-made constituents).

Drought conditions can significantly reduce available surface water supplies because the reliability of surface water supply is dependent on hydrologic variations and the ability to store and extract water from available storage reservoirs. Precipitation, river flows and the incidental recharge of applied irrigation water are the primary sources of groundwater recharge to the groundwater basin. While drought conditions can reduce available groundwater supplies by reducing available recharge, this effect is less pronounced for groundwater than for surface water supplies, and is not expected to result in a reduction in groundwater pumping during dry years. The City's conjunctive use water supply strategy allows for flexibility in their water supply planning to address existing and future water supply constraints.

By using treated surface water in-lieu of groundwater in normal years, the City will bank groundwater supplies for use in meeting dry year and peak period water demands. The City's future water supply planning incorporates sufficient surface water supplies to allow the City to meet demands primarily through the use of surface water, allowing the in-lieu banking of groundwater for future use, thereby protecting the groundwater basin from overdraft and water quality degradation. For the City's service area south of the Tuolumne River, groundwater will continue to serve as the only source of supply.

In contrast to surface supply reliability, reliability of local groundwater supplies is threatened by poor water quality. In the past, contamination from arsenic, uranium, PCE, TCE, DBCP, and nitrate has resulted in the need for wellhead treatment to keep wells from being taken out of service. The City has developed a strategy to keep existing wells on-line and bring selected out-of-service wells back on-line through a combination of wellhead treatment, blending, and aggressive monitoring. As a result, the City does not anticipate groundwater quality to threaten the City's ability to pump and deliver groundwater supplies as needed to supplement its treated surface water supply and meet current and future water demands.

Legal issues, including place of use and water rights issues, are not anticipated to limit supply reliability for the City and MID's water supplies in future years. In certain situations, environmental factors can sometimes limit the reliability of surface water supplies, such as during a drought when dry year supply cutbacks are necessary to maintain the health of aquatic species and the environment in general. This issue is of particular concern for Delta water users, where

dry year supplies can be greatly reduced to maintain adequate water supplies for environmental purposes. Although environmental issues to date have not been a limiting factor in available water supplies to the City and MID, the regulatory process under Federal Energy Regulatory Commission (FERC) relicensing introduces potential uncertainties. Additionally, backup power and transmission/distribution system redundancies add reliability to the extraction, treatment and distribution of groundwater supplies to existing and future customers.

The vulnerability of MID's wholesale supplies and the City's local groundwater supplies to the previously mentioned constraints and the management strategies for addressing these vulnerabilities are discussed in the sections below.

## 7.2 RELIABILITY BY TYPE OF YEAR

The quantity of supply available from different water supply sources can vary from one year to the next depending on hydrologic conditions. Historical data, where available, were used to develop a projected yield for each water supply source under three conditions: (1) normal water year, (2) single dry water year, and (3) multiple dry water years. In accordance with the DWR Guidebook, each condition is defined as follows:

- **Normal Water Year:** The year in the historical sequence most closely representing average runoff or allocation levels and patterns.
- **Single-Dry Water Year:** The year with the lowest annual runoff or allocation in the historical sequence.
- **Multiple-Dry Water Years:** The lowest average runoff or allocation for a consecutive 3-year<sup>1</sup> period in the historical sequence.

### 7.2.1 Supply Reliability for the City

Under normal/wet water year supply conditions, it is assumed that the City will receive its full allotment of their MID treated surface water delivery. As discussed in Chapter 6, the ARTDA between MID and the City includes a formula to reduce deliveries in drier than average years based on the number of inches allocated to MID's agricultural customers. In 2014 and 2015, the available supply from MID was reduced significantly due to drought conditions. Surface water supply reductions in 2014 and 2015 were as follows:

- In 2014, the available supply was 24 inches of the total 42-inch allocation (equivalent to a 43 percent reduction), resulting in a treated water supply delivery to the City of approximately 19,200 AF (approximately 17 MGD) for the 2014/2015 water year (May 1, 2014 through April 30, 2015); and

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<sup>1</sup> A minimum of three consecutive years must be used, but a longer period is allowed.



- In 2015, the available supply was 16 inches of the total 42-inch allocation (equivalent to a 62 percent reduction), resulting in a treated water supply delivery to the City of approximately 12,800 AF (approximately 11 MGD) for the 2015/16 water year (May 1, 2015 through April 30, 2016).

The ARTDA does provide the opportunity for the City to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water during drought years if such supplemental supplies are available. However, the City did not purchase additional treated surface water supplies in 2014 or 2015. Instead, the City chose to increase groundwater production and implement an aggressive water conservation program to help reduce water demands to match available supplies.

In 2014 and 2015, the City's water demands were significantly reduced as a result of water conservation. Water conservation measures included both voluntary actions implemented by the City's water customers and mandatory measures implemented by the City in response to the drought conditions and as mandated by the Governor's Executive Order calling for a statewide reduction in urban water use of 25 percent (as compared to 2013). Each urban water supplier in California was assigned a conservation standard (a percent reduction as compared to 2013 water use) to achieve the statewide water conservation goal. The City's conservation standard was a reduction of 36 percent (as compared to 2013 water use)<sup>2</sup>. From June 2015 to October 2015, the City achieved a cumulative savings of 29.1 percent (as compared to the same months in 2013). This is less than the 36 percent conservation standard set for the City, but is still a very significant reduction in water demand. The success of these recent water conservation measures has shown that the City has the ability to reduce water demands if needed to respond to water supply shortages.

The City's increase in groundwater production in response to the recent shortage in treated surface water supplies is within the operational yield estimates for the Modesto and Turlock Subbasins, and is not anticipated to have any adverse effects on the underlying groundwater subbasins or resources. In the future, if the City were to implement an ASR Program, the City may be able to inject surplus treated surface water supplies available in normal or wet years into the underlying groundwater subbasins and bank it for later extraction during dry years and/or use during seasonal demand peaking. Such a program would provide the City with added supply reliability during dry years.

For the purpose of estimating supply reductions during droughts, estimated MID delivery cutbacks were based on the recent 2015 water supply condition. It was assumed that 2015 was the fifth year of a five-year drought with equally proportioned shortages for the five years (or a 26-inch reduction/5 years for a 5.2-inch effective reduction per year). Therefore, for planning purposes, the MID delivery cutbacks experienced in each successive drought year are assumed as follows:

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<sup>2</sup> Effective March 1, 2016, the Urban Water Supplier Water Conservation Standard for the City of Modesto was reduced to 33 percent.

## Chapter 7

### Water Supply Reliability Assessment



- First year cutback: 5.2/42 inches (12.4 percent)
- Second year cutback: 10.4/42 inches (24.8 percent)
- Third year cutback: 15.6/42 inches (37.1 percent)
- Fourth year cutback: 20.8/42 inches (49.5 percent)
- Fifth year cutback: 26.0/42 inches (61.9 percent)

It was assumed that, for a single dry water year, MID delivery cutbacks would be equal to those experienced in 2015 (26/42 inches, or 61.9 percent). In dry years, the City plans to supplement reduced surface water supplies with banked groundwater supplies, as necessary, to meet water demands. When available, the City also has the ability to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water during drought years.

Table 7-1 lists the years that the City identifies as their average, single driest year, and driest multi-year period. These years are also known as the “base years”.

**Table 7-1. Basis for City and MID Water Year Data**

| Water Year Type   | Base Year(s)        | Assumed Water Supply Availability   |  |  |
|---|---------------------|---|--|--|
|   |                     | MID Deliveries  | Groundwater Pumping  | Total Supply   |
| Average/Normal Water Year   | 1984 <sup>(a)</sup> | Current MID supply of 33,600 AFA as described in the TDA. MID supply will increase with completion of MRWTP Phase Two to 67,200 AFA (by buildout of the City’s service area). | Assumed to be equal to total demand minus MID deliveries north of the Tuolumne River | Assumed to be equal to MID deliveries plus groundwater pumping |
| Single-Dry Water Year   | 2015                | Assumes 61.9 percent reduction in surface water supplies (equal to last year of a multi-year drought).  | Assumed to be equal to total demand minus MID deliveries north of the Tuolumne River | Assumed to be equal to MID deliveries plus groundwater pumping |
| Multiple-Dry Water Years  | 2011-2015           | Assumes an additional 12.4 percent reduction in surface water supplies per year (based on the 2015 MID cutback of 26 inches spread equally over 5 years).                     | Assumed to be equal to total demand minus MID deliveries north of the Tuolumne River | Assumed to be equal to MID deliveries plus groundwater pumping |
| <sup>(a)</sup> 1984 is representative of normal conditions for the area, based on the characterization of the year as an above normal year using the San Joaquin Valley Water Year Type Index. The index characterizes water year type based on the unimpaired flow at the following four locations: Stanislaus River below Goodwin Reservoir, Tuolumne River below La Grange, Merced River below Merced Falls, and San Joaquin River inflow to Millerton Lake. The unimpaired runoff for 1984 was 3.69 million AF (MAF). Above normal flow is characterized as flows greater than 3.1 MAF and less than 3.8 MAF. |                     |   |  |  |

## Chapter 7

### Water Supply Reliability Assessment



Table 7-2 shows the historical supply reliability for the City’s water supplies during the base years shown in Table 7-1. The available supplies column specifies the volume and percentage of the City’s total water supply expected if there were to be a repeat of the hydrology from that type of year. It should be noted that the City was not purchasing water supplies from MID in the base average/normal water year shown (deliveries from MID to the City began in 1995 with the completion of the MRWTP); therefore, the quantity shown is based on what the available supply would have been during the given hydrologic condition.

**Table 7-2. Retail: Basis of Water Year Data (DWR Table 7-1 Retail)**

| Year Type                                   | Base Year<br><i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i> | Available Supplies if Year Type Repeats |   |
|---|---|---|---|
|   |   | <input type="checkbox"/>                | Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.<br>Location _____ |
|   |   | <input checked="" type="checkbox"/>     | Quantification of available supplies is provided in this table as either volume only, percent only, or both.                    |
|   |   | Volume Available                        | % of Average Supply   |
| Average Year                                | 1984  | 87,100                                  | 100%  |
| Single-Dry Year                             | 2015  | 66,300                                  | 76%   |
| Multiple-Dry Years 1st Year                 | 2011  | 82,900                                  | 95%   |
| Multiple-Dry Years 2nd Year                 | 2012  | 78,800                                  | 90%   |
| Multiple-Dry Years 3rd Year                 | 2013  | 74,600                                  | 86%   |
| Multiple-Dry Years 4th Year <i>Optional</i> | 2014  | 70,500                                  | 81%   |
| Multiple-Dry Years 5th Year <i>Optional</i> | 2015  | 66,300                                  | 76%   |

NOTES: Volumes are in AF; totals rounded to nearest hundred. Includes both purchased water from MID and groundwater supplies. Volume of MID supply for the fifth multiple dry year based on the supply reduction that actually occurred in 2015. 2011 through 2014 MID supply volumes are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015). Assumes groundwater supply will not be reduced in dry years. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID.

Table 7-3 provides additional detail regarding the individual volumes from each of the City’s different water supply sources during the base years.

**Table 7-3. City of Modesto Base Year Water Supply Reliability, AFA**

| Supply  | Average/<br>Normal<br>Water Year | Single-Dry<br>Water Year | Multiple-Dry Water Years <sup>(a)</sup> |        |        |        |        |
|---|----------------------------------|--------------------------|---|--------|--------|--------|--------|
|   | 1984                             |                          | 2015                                    | Year 1 | Year 2 | Year 3 | Year 4 |
|   | 1984                             | 2015                     | 2011                                    | 2012   | 2013   | 2014   | 2015   |
| MID Supply—<br>Total Urban Supply <sup>(b)</sup>  | 33,600                           | 33,600                   | 33,600                                  | 33,600 | 33,600 | 33,600 | 33,600 |
| MID Supply—<br>Base Urban Supply <sup>(c)</sup>   | 33,600                           | 12,800                   | 29,400                                  | 25,300 | 21,100 | 17,000 | 12,800 |
| Groundwater <sup>(d)</sup>  | 53,500                           | 53,500                   | 53,500                                  | 53,500 | 53,500 | 53,500 | 53,500 |
| Percent of Average/Normal Year with<br>Base Urban MID Supply  |                                  | 76%                      | 95%                                     | 90%    | 86%    | 81%    | 76%    |
| Percent of Average/Normal Year with<br>Total Urban MID Supply   |                                  | 100%                     | 100%                                    | 100%   | 100%   | 100%   | 100%   |
| <sup>(a)</sup> 2015 MID Base Urban Supply based on the actual supply reduction from MID in 2015 (26-inches). 2011 through 2014 MID Base Urban Supply totals are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015).<br><sup>(b)</sup> Hypothetical supply available to the City if the MRWTP had been available. Phase One of the MRWTP was completed in 1995. Historical totals assume only Phase One of the MRWTP was available.<br><sup>(c)</sup> Includes the following cutbacks during dry years:<br>- Single-Dry Water Year: 61.9 percent<br>- Multiple-Dry Water Years: Estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015)<br><sup>(d)</sup> Based on the estimated “operational yield” of the groundwater basin underlying the City’s service area. |                                  |                          |   |        |        |        |        |

### 7.2.2 Supply Reliability for MID

As described above, MID surface water supplies are subject to cutbacks based on climatic variability. Table 7-4 shows the historical supply reliability for MID’s wholesale treated surface water deliveries to the City during the base years shown in Table 7-1. As discussed above, MID was not delivering treated surface water supply to the City in the base average/normal water year shown; therefore, the quantity shown is based on what the available supply would have been during the given hydrologic condition.

**Table 7-4. Wholesale: Basis of Water Year Data (DWR Table 7-1 Wholesale)**

| Year Type                                   | Base Year<br><i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i> | Available Supplies if Year Type Repeats |   |
|---|---|---|---|
|   |   | <input type="checkbox"/>                | Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.<br>Location _____ |
|   |   | <input checked="" type="checkbox"/>     | Quantification of available supplies is provided in this table as either volume only, percent only, or both.                    |
|   |   | Volume Available                        | % of Average Supply   |
| Average Year                                | 1984  | 33,600                                  | 100%  |
| Single-Dry Year                             | 2015  | 12,800                                  | 38%   |
| Multiple-Dry Years 1st Year                 | 2011  | 29,400                                  | 88%   |
| Multiple-Dry Years 2nd Year                 | 2012  | 25,300                                  | 75%   |
| Multiple-Dry Years 3rd Year                 | 2013  | 21,100                                  | 63%   |
| Multiple-Dry Years 4th Year <i>Optional</i> | 2014  | 17,000                                  | 50%   |
| Multiple-Dry Years 5th Year <i>Optional</i> | 2015  | 12,800                                  | 38%   |

NOTES: Volumes are in AF; totals rounded to nearest hundred. Volume for the fifth multiple dry year based on the supply reduction that actually occurred in 2015. 2011 through 2014 volumes are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID.

### 7.3 SUPPLY AND DEMAND ASSESSMENT

In order to make the best determination of the reliability of the City and MID’s water supplies, the supply and demand for various types of water years are quantified and discussed below.

#### 7.3.1 Normal Water Year

##### 7.3.1.1 City of Modesto

The City’s Normal Water Year supplies are anticipated to be as follows:

- MRWTP Phase One supply of 33,600 AFA;

- The additional supply available to the City from the MRWTP Phase Two Expansion project is assumed to be 11,200 AFA by 2020 and will increase as additional development occurs within the City’s contiguous service area up to an additional total treatment capacity of 33,600 AFA at 2050<sup>3</sup>;
- Groundwater pumping from City’s local groundwater basins (up to 53,500 AFA) is assumed to provide 100 percent of the City’s remaining water demand.

As described in Chapter 4, the City’s Normal Water Year demands have been projected based on remaining vacant land assumed to be developed by buildout (estimated at 2050) in the City’s service area (additional details are in the City’s Water Master Plan (2016)).

As shown in Table 7-5, the City’s Normal Water Year supplies are adequate to meet projected Normal Water Year demands.

**Table 7-5. Retail: Normal Year Supply and Demand Comparison (DWR Table 7-2 Retail)**

|                           | 2020   | 2025   | 2030   | 2035   | 2040<br>(Opt) |
|---------------------------|--------|--------|--------|--------|---------------|
| Supply totals             | 69,466 | 74,904 | 80,342 | 85,780 | 91,218        |
| Demand totals             | 69,466 | 74,904 | 80,342 | 85,780 | 91,218        |
| Difference                | 0      | 0      | 0      | 0      | 0             |
| NOTES: Volumes are in AF. |        |        |        |        |               |

**7.3.1.2 MID**

MID’s total urban supply is assumed to be approximately 44,800 AFA in 2020 and will increase as additional development occurs within the City’s contiguous service area (up to 67,200 AFA at 2050). MID’s wholesale water demand is projected to match the available supply as the City plans to maximize the use of treated surface water supply. As shown in Table 7-6, MID’s Normal Water Year supply is adequate to meet projected Normal Water Year demands.

<sup>3</sup> Projected buildout time frame for the City’s contiguous service area. The actual volume and timing of available supply from the MRWTP Phase Two Expansion project will be determined based on the amount of agricultural land converted to urban uses.

**Table 7-6. Wholesale: Normal Year Supply and Demand Comparison (DWR Table 7-2 Wholesale)**

|               | 2020   | 2025   | 2030   | 2035   | 2040<br>(Opt) |
|---------------|--------|--------|--------|--------|---------------|
| Supply totals | 44,800 | 48,533 | 52,267 | 56,000 | 59,733        |
| Demand totals | 44,800 | 48,533 | 52,267 | 56,000 | 59,733        |
| Difference    | 0      | 0      | 0      | 0      | 0             |

NOTES: Volumes are in AF.

### 7.3.2 Single-Dry Water Year

#### 7.3.2.1 City of Modesto

The City’s Single Dry Year supplies are anticipated to be as follows:

- Projected base purchased surface water supplies from MRWTP Phase One and the MRWTP Phase Two Expansion (with a 61.9 percent reduction from Normal Year MID supplies)<sup>4</sup>; and
- Groundwater pumping from City’s local groundwater basins (up to 53,500 AFA).

When required, the City’s Single Dry Year demands are assumed to be reduced through water conservation to match available supplies. As discussed above, the City has been successful at significantly reducing water demands during 2014 and 2015 and, if needed, will be able to implement existing and proposed water conservation measures to respond to future water supply shortages.

As shown in Table 7-7, the City’s Single Dry Year supplies are adequate to meet projected Single Dry Year demands with water conservation.

<sup>4</sup> If available, the City has the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. For planning purposes, it is conservatively assumed that supplemental treated surface water supply is not available during a single dry year.

**Table 7-7. Retail: Single Dry Year Supply and Demand Comparison (DWR Table 7-3 Retail)**

|               | 2020   | 2025   | 2030   | 2035   | 2040 (Opt) |
|---------------|--------|--------|--------|--------|------------|
| Supply totals | 69,466 | 71,991 | 73,414 | 74,836 | 76,258     |
| Demand totals | 69,466 | 71,991 | 73,414 | 74,836 | 76,258     |
| Difference    | 0      | 0      | 0      | 0      | 0          |

NOTES: Volumes are in AF. For planning purposes, a conservative supply condition assuming a 61.9 percent reduction in MID treated water supply during a single dry year is used here. Available groundwater supply assumed to be 53,500 AFA. The following demand reductions were required to match available supplies during a single dry year condition:

- 2020 - 0%
- 2025 - 4%
- 2030 - 9%
- 2035 - 13%
- 2040 - 16%

**7.3.2.2 MID**

In single dry years, the MID base urban supply is projected to be reduced by approximately 61.9 percent (as a result of reduced surface water deliveries). If available, the difference between dry year base supply and normal year supply will be available as an allocation on an optional basis at additional cost to the retail supplier. However, for planning purposes, a conservative supply condition assuming a 61.9 percent reduction in treated water supply is used.

As shown in Table 7-8, MID’s Single Dry year supply is adequate to meet projected Single Dry Year demands. MID’s wholesale water demand is projected to match the available supply as the City plans to maximize the use of treated surface water supply.



**Table 7-8. Wholesale: Single Dry Year Supply and Demand Comparison (DWR Table 7-3 Wholesale)**

|               | 2020   | 2025   | 2030   | 2035   | 2040 (Opt) |
|---------------|--------|--------|--------|--------|------------|
| Supply totals | 17,069 | 18,491 | 19,914 | 21,336 | 22,758     |
| Demand totals | 17,069 | 18,491 | 19,914 | 21,336 | 22,758     |
| Difference    | 0      | 0      | 0      | 0      | 0          |

NOTES: Volumes are in AF. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming a 61.9 percent reduction in treated water supply during a single dry year is used here.

### 7.3.3 Multiple-Dry Water Years

#### 7.3.3.1 City of Modesto

The City’s Multiple Dry Year supplies are anticipated to be as follows:

- Projected base purchased surface water supplies from MRWTP Phase One and the MRWTP Phase Two Expansion (with a 12.4 percent reduction from Normal Year MID supplies during the first dry year and an additional 12.4 percent reduction in each successive dry year)<sup>5</sup>; and
- Groundwater pumping from City’s local groundwater basins (up to 53,500 AFA).

As shown in Table 7-9, the City’s Multiple Dry Year supplies are adequate to meet projected Multiple Dry Year demands with water conservation. When required, the City’s Multiple Dry Year demands are assumed to be reduced through water conservation to match available supplies. As discussed above, the City has been successful at significantly reducing water demands during 2014 and 2015 and, if needed, will be able to implement existing and proposed water conservation measures to respond to future water supply shortages.

<sup>5</sup> If available, the City has the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. For planning purposes, it is conservatively assumed that supplemental treated surface water supply is not available during multiple dry years.

**Table 7-9. Retail: Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4 Retail)**

|                                  |               | 2020   | 2025   | 2030   | 2035   | 2040 (Opt) |
|----------------------------------|---------------|--------|--------|--------|--------|------------|
| First year                       | Supply totals | 69,466 | 74,904 | 80,342 | 85,780 | 91,218     |
|                                  | Demand totals | 69,466 | 74,904 | 80,342 | 85,780 | 91,218     |
|                                  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Second year                      | Supply totals | 70,553 | 75,991 | 81,429 | 86,867 | 92,305     |
|                                  | Demand totals | 70,553 | 75,991 | 81,429 | 86,867 | 92,305     |
|                                  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Third year                       | Supply totals | 71,641 | 77,079 | 82,517 | 87,955 | 92,012     |
|                                  | Demand totals | 71,641 | 77,079 | 82,517 | 87,955 | 92,012     |
|                                  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Fourth year<br><i>(optional)</i> | Supply totals | 72,728 | 78,167 | 81,026 | 82,911 | 84,796     |
|                                  | Demand totals | 72,728 | 78,167 | 81,026 | 82,911 | 84,796     |
|                                  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Fifth year<br><i>(optional)</i>  | Supply totals | 71,707 | 73,129 | 74,551 | 75,974 | 77,396     |
|                                  | Demand totals | 71,707 | 73,129 | 74,551 | 75,974 | 77,396     |
|                                  | Difference    | 0      | 0      | 0      | 0      | 0          |

NOTES: Volumes are in AF. Projected demand based on the City of Modesto Water Master Plan. For planning purposes, a conservative supply condition assuming a 12.4, 24.8, 37.1, 49.5, and 61.9 percent reduction in MID treated water supply during consecutive dry years is used here. Available groundwater supply assumed to be 53,500 AFA. Demand reductions between 1 to 20 percent were required to match available supplies during the third, fourth, and fifth years.

**7.3.3.2 MID**

In multiple dry years, the MID base urban supply is projected to be reduced by approximately 12.4 percent during the first year with an additional 12.4 percent reduction in successive years during an extended drought. If available, the difference between dry year base supply and normal year supply will be available as an allocation on an optional basis at additional cost to the retail

supplier. However, for planning purposes, a conservative supply condition assuming reductions in treated water supply is used.

As shown in Table 7-10, MID’s Multiple Dry Year supply is adequate to meet projected Multiple Dry Year demands. MID’s wholesale water demand is projected to match the available supply as the City plans to maximize the use of treated surface water supply.

**Table 7-10. Wholesale: Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4 Wholesale)**

|                        |               | 2020   | 2025   | 2030   | 2035   | 2040 (Opt) |
|------------------------|---------------|--------|--------|--------|--------|------------|
| First year             | Supply totals | 39,245 | 42,515 | 45,786 | 49,056 | 52,326     |
|                        | Demand totals | 39,245 | 42,515 | 45,786 | 49,056 | 52,326     |
|                        | Difference    | 0      | 0      | 0      | 0      | 0          |
| Second year            | Supply totals | 34,251 | 37,059 | 39,866 | 42,674 | 45,481     |
|                        | Demand totals | 34,251 | 37,059 | 39,866 | 42,674 | 45,481     |
|                        | Difference    | 0      | 0      | 0      | 0      | 0          |
| Third year             | Supply totals | 29,118 | 31,467 | 33,815 | 36,163 | 38,512     |
|                        | Demand totals | 29,118 | 31,467 | 33,815 | 36,163 | 38,512     |
|                        | Difference    | 0      | 0      | 0      | 0      | 0          |
| Fourth year (optional) | Supply totals | 23,755 | 25,640 | 27,526 | 29,411 | 31,296     |
|                        | Demand totals | 23,755 | 25,640 | 27,526 | 29,411 | 31,296     |
|                        | Difference    | 0      | 0      | 0      | 0      | 0          |
| Fifth year (optional)  | Supply totals | 18,207 | 19,629 | 21,051 | 22,474 | 23,896     |
|                        | Demand totals | 18,207 | 19,629 | 21,051 | 22,474 | 23,896     |
|                        | Difference    | 0      | 0      | 0      | 0      | 0          |

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming multiple dry year reductions is used here (Year 1 = 12.4%, Year 2 = 24.8%, Year 3 = 37.1%, Year 4 = 49.5%, and Year 5 = 61.9%).

## 7.4 REGIONAL SUPPLY RELIABILITY

The City and MID's water management tools and options that would maximize the use of local water resources and minimize the need to import water from other regions are discussed below.

### 7.4.1 Management Tools and Options for the City

The City's current water supply portfolio of local Tuolumne River water from MID and groundwater provides considerable flexibility in maximizing local resources. Supply from MID is treated at the MRWTP. The operating permit for the MRWTP does not allow treatment of supply other than from the Tuolumne River. Design of specific treatment methods at the plant are also based on the water chemistry of that local source.

The City currently maximizes the use of its surface water supply from MID in normal and wetter years. The use of this surface water supply provides the City with the flexibility to preserve its available groundwater supplies, through in-lieu banking.

To minimize the City's vulnerability to groundwater quality issues, the City has also developed strategies to maintain and enhance its groundwater extraction capacity through a combination of well monitoring for early detection, well rehabilitation, wellhead treatment and blending.

With these available management tools, the City does not currently foresee a need to import water from other regions.

### 7.4.2 Management Tools and Options for MID

MID is primarily an agricultural water supplier. MID has the ability to reduce deliveries in drought years when surface water supplies are reduced. MID also has approximately 93 groundwater wells that it owns and maintains that are used to supplement surface water supplies during drought conditions when surface water supplies are limited. These groundwater wells are used for agricultural supply only and are not used for drinking water purposes. MID does not currently foresee a need to import water from other regions.

## CHAPTER 8

# Water Shortage Contingency Planning



This chapter describes the City’s strategic planning process to prepare for and respond to water shortages. This includes the estimated three-year minimum water supply and a summary of the stages and actions described in the City’s Drought Contingency Plan that will be implemented in the event of a water supply shortage. The purpose of the Drought Contingency Plan, also known as a Water Shortage Contingency Plan (WSCP), is to help the City maintain reliable water supplies and reduce the impacts of water supply shortfalls.

In 2015, the State Water Resources Control Board mandated a 36 percent reduction in residential water use for the City<sup>1</sup>. In order to meet this goal, the City’s Utilities Department recommended the City Council to adopt a revised Drought Contingency Plan (to include an additional Stage IIA drought condition) and to also declare a more severe Stage II drought condition. The City’s revised Drought Contingency Plan was approved, and the City entered into a Stage II drought condition on May 1, 2015. A copy of the City’s current Drought Contingency Plan is provided in Appendix I. On November 24, 2015, City Council approved enacting a Stage IIA drought condition, effective December 1, 2015. On April 26, 2016, City Council approved reinstatement of Stage II drought requirements, effective May 1, 2016 through October 31, 2016.

Because MID is a wholesale water supplier and does not directly serve any urban customers, MID does not have a separate Water Shortage Contingency Plan which applies to urban customers. Therefore, the majority of the sections below only focus on water shortage contingency planning for the City’s water service area. MID does have a Drought Management Plan, developed in September 2015, which defines three ‘Levels of Surface Water Shortage’ and a variety of innovative strategies for agricultural water uses to cope with drought for each level. MID’s Drought Management Plan is included in Appendix E of MID’s 2015 Agricultural Water Management Plan Update<sup>2</sup>.

### 8.1 STAGES OF ACTION

#### 8.1.1 City of Modesto

The City’s Water Shortage Contingency Plan stages will be triggered based on the City’s evaluation of available supplies from MID and the City’s groundwater supplies. The stages of action in the City’s Drought Contingency Plan specify reduction objectives ranging from 10 to 50 percent of normal water demand, depending on the water shortage stage declared. All four stages prohibit certain water uses at specific times, with prohibitions becoming stricter as supplies continue to decrease. The water supply conditions associated with each of the City’s stages of action are identified in Table 8-1. As of May 1, 2016, the City is in Stage II of its Drought Contingency Plan.

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<sup>1</sup> Effective March 1, 2016, the Urban Water Supplier Water Conservation Standard for the City of Modesto was reduced to 33 percent.

<sup>2</sup> Modesto Irrigation District, 2015 Agricultural Water Management Plan Update, prepared by Provost & Pritchard, December 2015.

**Table 8-1. Retail: Stages of Water Shortage Contingency Plan (DWR Table 8-1 Retail)**

| Stage   | Percent Supply Reduction <sup>1</sup> | Water Supply Condition      |
|---|---------------------------------------|-----------------------------|
| I   | 10-20%                                | Minor Shortage Potential    |
| II  | 20-35%                                | Moderate Shortage Potential |
| IIA   | 30-40%                                | Medium Shortage Potential   |
| III   | 35-50%                                | Critical Shortage Potential |
| <sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%. |                                       |                             |
| NOTES: Based on the City's December 1, 2015 Drought Contingency Plan.                               |                                       |                             |

The City’s Director of Utilities is responsible for declaring a particular water shortage stage and reduction percentage. This declaration is based on his/her judgment as to the degree of the immediate or future supply deficiency.

**8.1.2 MID**

As discussed above, MID does not directly serve any urban customers and does not have a separate Water Shortage Contingency Plan as shown in Table 8-2. However, as described in Chapters 6 and 7, water shortage provisions are included in the ARTDA between MID and the City. Those provisions will be implemented by MID as needed if a shortage of MID’s water supplies were to occur; however, the actual reduction in supply is not determined until the time of the shortage (ARTDA, Section 17.2 Formula for Water Allocation). A draft resolution citing and implementing these provisions is provided in Appendix I.

**Table 8-2. Wholesale: Stages of Water Shortage Contingency Plan (DWR Table 8-1 Wholesale)**

| Stage   | Supply Reduction <sup>1</sup> | Water Supply Condition |
|---|-------------------------------|------------------------|
| N/A   | N/A                           | N/A                    |
| <sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%. |                               |                        |
| NOTES: MID does not have a Water Shortage Contingency Plan.   |                               |                        |

**8.2 PROHIBITIONS ON END USES**

California Water Code Section 10632(a)(4) requires mandatory prohibitions against specific water use practices that may be considered excessive during water shortages.

Once the City’s Director of Utilities declares a particular water shortage stage, a series of requested consumer actions is announced to the community. The prohibitions that the City places on end uses in each stage are summarized in Table 8-3. If a measure is declared mandatory for a lower level stage, it is also mandatory for all higher level stages.

# Chapter 8

## Water Shortage Contingency Planning



**Table 8-3. Retail Only: Restrictions and Prohibitions on End Uses (DWR Table 8-2 Retail)**

| Stage | Restrictions and Prohibitions on End Users  | Additional Explanation or Reference<br><i>(optional)</i>  | Penalty, Charge, or Other Enforcement? |
|-------|---|---|--|
| I     | Landscape - Limit landscape irrigation to specific times                                    | Prohibit outdoor water use from noon - 7 PM, however, may be extended to 9 AM - 7 PM at Council discretion                | Yes                                    |
| II    | Landscape - Limit landscape irrigation to specific times                                    | Prohibit outdoor water use from 9 AM - 7 PM   | Yes                                    |
| I     | Landscape - Limit landscape irrigation to specific days                                     | Limit to no more than 3 days per week; odd-numbered addresses water W, F, Su and even-numbered addresses water Tu, Th, Sa | Yes                                    |
| II    | Landscape - Limit landscape irrigation to specific days                                     | Limit to no more than 2 days per week; odd-numbered addresses water W & Su and even-numbered addresses water Tu & Sa      | Yes                                    |
| IIA   | Landscape - Limit landscape irrigation to specific days                                     | Limit to no more than 1 day per week; odd-numbered addresses water Su and even-numbered addresses water Sa                | Yes                                    |
| III   | Landscape - Prohibit certain types of landscape irrigation                                  | No outdoor water use except for trees or shrubs by hand and vegetation maintained through drip irrigation                 | Yes                                    |
| III   | Landscape - Prohibit all landscape irrigation   | Moratorium on all new landscaping   | Yes                                    |
| I     | Landscape - Other landscape restriction or prohibition                                      | New landscaping must comply with existing and future landscape ordinances   | Yes                                    |
| II    | Landscape - Other landscape restriction or prohibition                                      | No irrigating turf or ornamental landscapes during or and 48 hours following measurable rainfall                          | Yes                                    |
| II    | CII - Lodging establishment must offer opt out of linen service                             |   | Yes                                    |
| I     | CII - Restaurants may only serve water upon request   | Encouraged only   | No                                     |
| II    | CII - Restaurants may only serve water upon request   |   | Yes                                    |
| III   | CII - Other CII restriction or prohibition  | Moratorium on all new connections   | Yes                                    |
| II    | Water Features - Restrict water use for decorative water features, such as fountains        | No use of outdoor fountains except for maintenance purposes   | Yes                                    |
| III   | Other water feature or swimming pool restriction  | Moratorium on all new swimming pools  | Yes                                    |
| I     | Other - Customers must repair leaks, breaks, and malfunctions in a timely manner            | Water leaks, once identified by home owner, must be repaired within 24 hours  | Yes                                    |
| I     | Other - Require automatic shut of hoses   |   | Yes                                    |
| I     | Other - Prohibit use of potable water for washing hard surfaces                             | Hosing concrete areas, building exteriors, etc., is prohibited except for health and safety concerns                      | Yes                                    |
| III   | Other - Prohibit vehicle washing except at facilities using recycled or recirculating water | Permitted at car wash facilities only   | Yes                                    |
| I     | Other   | Car washing limited to specific times and days (same as irrigation use)   | Yes                                    |
| I     | Other   | Require water meter installation on all new single family homes   | Yes                                    |
| II    | Other   | Mandatory retrofit of low flow showerheads in homes when building/remodeling occurs                                       | Yes                                    |
| III   | Other   | Mandatory retrofit of low flow toilets in homes when building/remodeling occurs   | Yes                                    |

NOTES: Based on the City's December 1, 2015 Drought Contingency Plan.

**8.3 PENALTIES, CHARGES, OTHER ENFORCEMENT OF PROHIBITIONS**

California Water Code Section 10632(a)(6) requires a water supplier to penalize or charge for excessive water use, where applicable.

During a declared water shortage stage, penalties for excess water use exist in the form of administrative fees or fines. These fines are assessed based on the number of violations a particular customer accumulates during a particular stage. The penalty for the first violation for all three stages consists of a warning only, requiring no fine. However, a fine is issued for a second violation, and increasingly expensive fines are issued for any subsequent violations thereafter (all penalties are assessed for violations occurring within 12 months of first violation). The City’s administrative fines for excessive water use are summarized in Table 8-4.

**Table 8-4. City of Modesto Penalties and Charges for Excessive Water Use**

| Stage      | Penalties and Charges  |
|------------|--|
| I          | \$50 Administrative fee assessed upon second violation<br>\$200 Administrative fee assessed upon third violation (includes meter installation)<br>\$500 Administrative fee assessed for each subsequent violation  |
| II and IIA | \$150 Administrative fee assessed upon second violation<br>\$250 Administrative fee assessed upon third violation (includes meter installation)<br>\$500 Administrative fee assessed for each subsequent violation |
| III        | \$200 Administrative fee assessed upon second violation<br>\$300 Administrative fee assessed upon third violation (includes meter installation)<br>\$500 Administrative fee assessed for each subsequent violation |

**8.4 CONSUMPTION REDUCTION METHODS**

**8.4.1 City of Modesto**

In accordance with California Water Code Section 10632(a)(5), the City may implement consumption reduction methods during water emergency stages.

Consumption reduction methods are actions that reduce water demand within the City’s service area, whereas prohibitions, as described in Section 8.2, limit specific uses of water. The City will use the consumption reduction methods listed in Table 8-5. The consumption reduction methods associated with an “All” water shortage stage are part of the City’s on-going Demand Management Measures (DMMs) (see *Chapter 9 Demand Management Measures*).



**Table 8-5. Retail: Stages of Water Shortage Contingency Plan – Consumption Reduction Methods (DWR Table 8-3 Retail)**

| Stage  | Consumption Reduction Methods by Water Supplier           | Additional Explanation or Reference<br><i>(optional)</i> |
|--|---|--|
| All  | Expand Public Information Campaign                        |  |
| All  | Improve Customer Billing                                  | Residential metering program                             |
| All  | Offer Water Use Surveys                                   | Residential water surveys and landscape water surveys    |
| All  | Provide Rebates on Plumbing Fixtures and Devices          |  |
| All  | Provide Rebates for Landscape Irrigation Efficiency       |  |
| All  | Decrease Line Flushing                                    |  |
| All  | Increase Water Waste Patrols                              |  |
| I  | Reduce System Water Loss                                  | Repair water leaks                                       |
| III  | Moratorium or Net Zero Demand Increase on New Connections | Moratorium on all new landscaping and connections        |
| All  | Other   |  |
| NOTES: Consumption reduction methods associated with an "All" stage are on-going DMMs (see Chapter 9 for additional discussion). |   |  |

#### 8.4.2 MID

MID is primarily an agricultural water supplier. MID has the ability to reduce agricultural deliveries in drought years when surface water supplies are reduced. As stated in the ARTDA, MID also has the ability to reduce deliveries to the City in drier than average years based on the proportional number of inches allocated to MID’s agricultural customers. MID also has approximately 93 groundwater wells that it owns and maintains that are used to supplement surface water supplies during drought conditions when surface water supplies are limited. However, these groundwater wells are used for agricultural supply only and are not used for drinking water purposes.

#### 8.5 DETERMINING WATER SHORTAGE REDUCTIONS

California Water Code Section 10632(a)(9) requires the water supplier to develop a mechanism for determining actual reductions in water use in the course of carrying out the urban water supply shortage contingency analysis.

As described in Chapter 6, the City is supplied with treated surface water from MID and municipal groundwater wells. MID’s MRWTP and the City’s wells have flow monitoring devices that record the amount of water entering the City’s distribution system. The flow devices are connected to the City’s SCADA system, allowing past and real-time flow trends to be analyzed at the City’s Control Center and actual water use reductions to be determined. Further, the City is in the process of

converting all customers to meters, and the meter retrofit program is anticipated to be completed by 2020. Once the conversion to metered water use is complete, the City will be able to determine reductions in demand based on metered usage. The City’s water use monitoring mechanisms are summarized in Table 8-6.

**Table 8-6. City of Modesto Water Use Monitoring Mechanisms**

| Mechanism for Determining Actual Reductions | Type of Data Expected |
|---|-----------------------|
| MRWTP and Groundwater Monitoring            | Production Volume     |
| Water Meters                                | Demand                |

**8.6 REVENUE AND EXPENDITURE IMPACTS**

California Water Code Section 10632(a)(7) requires an analysis of the impacts of each of the actions taken for conservation and water restriction on the revenues and expenditures of the water supplier.

**8.6.1 City of Modesto**

The City’s water operations are organized as an Enterprise Fund in which the costs of providing goods or services to the general public on a continuing basis are financed or recovered primarily through user charges. The water funds have historically brought in sufficient revenue to allow inter-fund transfers for repayment of contributed capital or to fund capital improvement projects and information and technology projects.

Implementation of the Drought Contingency Plan results in reduced water usage, and accordingly, reduced operating revenues. However, operating expenses would also be reduced due to the lower customer water demands that result in a need to purchase less surface water and/or pump less groundwater.

Implementation of Stage II, IIA, and III drought restrictions are expected to have the following impacts on operating revenues:

- Water sales based on metered rates are expected to decrease up to 35 percent under Stage II;
- Water sales based on metered rates are expected to decrease up to 40 percent under Stage IIA; and
- Water sales based on metered rates are expected to decrease up to 50 percent under Stage III.

Currently, revenue from flat rate water sales provides a level of financial stability for the City, even when water use is reduced. However, in the future, as the City converts all of its flat rate accounts to metered accounts, it will become more vulnerable to revenue impacts as a result of water use reductions.

Expenditure impacts resulting from implementation of the Drought Contingency Plan may include additional costs to provide increased outreach to customers about water conservation, purchases of more expensive water supplies, and possibly, developing and/or implementing a drought rate structure.

If needed, funding for water shortages will come through a temporary rate increase and/or fund reserves. Other potential funding sources and/or water shortage management options include close monitoring, managing the short-term water reduction plan, initiating a water contingency fund and/or temporary deferral of capital improvement projects. There may be additional outside funding sources made available to water agencies under a water emergency situation (Stage III). The City's proposed measures for overcoming revenue and expenditure impacts are summarized below:

- Rate adjustment;
- Water shortage contingency fund;
- Temporary deferral of capital improvement projects; and
- Additional outside funding sources.

#### 8.6.2 MID

Per the ARTDA, the City pays all expenses for the operation of the MRWTP whether it is producing water or not, so there is no revenue shortfall to MID if the production of treated surface water is reduced.

### 8.7 RESOLUTION OR ORDINANCE

#### 8.7.1 City of Modesto

As a requirement of the UWMPs, the City is required to develop a water shortage contingency resolution or ordinance for submittal with the UWMP. On November 24, 2015, City Council adopted Resolution 2015-455 implementing Stage IIA of the City's Drought Contingency Plan effective December 1, 2015, and on April 26, 2016, City Council adopted Resolution 2016-178 reinstating Stage II of the City's Drought Contingency Plan. Copies of Resolutions 2015-455 and 2016-178 are included in Appendix I. If the City needs to implement another stage of the Drought Contingency Plan in the future, a similar resolution would be drafted for City Council consideration and approval.

#### 8.7.2 MID

MID does not have a specific Water Shortage Contingency Plan; however, water shortage provisions are included in the ARTDA between MID and the City. Those provisions will be implemented by MID as needed if a shortage of MID's supplies were to occur. A draft resolution citing and implementing these provisions is provided in Appendix I.

## 8.8 CATASTROPHIC SUPPLY INTERRUPTION

California Water Code Section 10632(a)(3) requires actions to be undertaken by the water supplier to prepare for and implement during a catastrophic interruption of water supplies.

### 8.8.1 City of Modesto

The City has prepared an *Emergency Operations Manual* which presents specific actions and procedures to follow during a catastrophic event interrupting either the City's supplies or MID's urban water supplies. These procedures include the immediate establishment of an Emergency Operations Center (EOC), which can direct actions to maintain an emergency water supply and announce water reduction orders.

### 8.8.2 MID

MID does not directly serve any urban customers, and therefore, is not required to prepare an Emergency Response Plan. However, during a catastrophic interruption of water supplies, MID expects to coordinate with the City and other local agencies on emergency response actions to help restore water service as quickly as possible.

## 8.9 MINIMUM SUPPLY NEXT THREE YEARS

As an UWMP requirement, all water agencies are required to provide an estimate of the minimum water supply available during each of the next three water years.

### 8.9.1 City of Modesto

The City's minimum supply estimate reflects the combined availability of all water supply sources and assumes the current water supply conditions for 2016, and the same hydrology that was noted in the historical multiple-dry year period (Chapter 7, Section 7.3) for 2017 and 2018. In Table 8-7, the City's minimum potable water supply available during 2017 and 2018 is estimated based on the driest multiple year historic sequence for the City's water supply. Table 8-7 conservatively assumes that the base purchased surface water supply from MID will be reduced<sup>3</sup>, but the City will be able to meet their remaining water demands through available groundwater supply and/or water conservation. However, the City may have the opportunity to purchase or exchange for supplemental purchased surface water supply from MID if available. In addition, Table 8-7 also includes a conservative assumption that additional supply from the MRWTP Phase Two Expansion project may not be available in the next three years because the volume that would be available depends on the amount of agricultural land converted to urban uses, which has not yet been determined.

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<sup>3</sup> For 2016, assumes a 14.3 percent surface water supply reduction (36-inches available) based on current conditions. For 2017 and 2018, assumes Years 4 and 5 surface water reductions during a multiple year drought (49.5 percent and 61.9 percent reductions, respectively).

**Table 8-7. Retail: Minimum Supply Next Three Years  
(DWR Table 8-4 Retail)**

|   | 2016   | 2017   | 2018   |
|---|--------|--------|--------|
| Available Water Supply  | 82,300 | 70,500 | 66,300 |
| <p>NOTES: Volumes are in AF; totals rounded to nearest hundred. For planning purposes, a conservative supply condition was used and assumes that the MRWTP Phase Two Expansion may not be available. 2016 based on current conditions (14.3 percent reduction in MID supply). 2017 and 2018 are estimated based on the driest multiple year historic sequence for the City’s water supply (Years 4 and 5: assumes 49.5 percent and 61.9 percent reductions in MID supply, respectively). Available groundwater supply assumed to be 53,500 AFA.</p> |        |        |        |

**8.9.2 MID**

Base purchased surface water supply available from MID in 2016 is based on current conditions (36-inches or 28,800 AFA). Base purchased surface water supplies available from MID in 2017 and 2018 assume the same hydrology that was noted in the driest historical multiple-dry year period (Chapter 7, Section 7.3). Table 8-8 shows MID’s minimum supply for the next three years. Table 8-8 conservatively assumes that: (1) the base purchased surface water supply from MID will be reduced based on the driest multiple year historic sequence (Years 4 and 5) for 2017 and 2018; and (2) the MRWTP Phase Two Expansion project may not be available in the next three years because the volume that would be available depends on the amount of agricultural land converted to urban uses, which has not yet been determined.



**Table 8-8. Wholesale: Minimum Supply Next Three Years (DWR Table 8-4 Wholesale)**

|                        | 2016   | 2017   | 2018   |
|------------------------|--------|--------|--------|
| Available Water Supply | 28,800 | 17,000 | 12,800 |

NOTES: Volumes are in AF; totals rounded to nearest hundred. The projected supply from the MRWTP Phase Two Expansion has not been determined so only the currently available supply was assumed (33,600 AFA) to be available in the next three years for conservative planning purposes. For 2016, assumes a 14.3 percent surface water supply reduction (36-inches available) based on current conditions. For 2017 and 2018, assumes Years 4 and 5 surface water reductions during a multiple year drought (49.5 percent and 61.9 percent reductions, respectively). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming multiple dry year reductions is used here.

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## CHAPTER 9

### Demand Management Measures



This chapter describes the City and MID's historical and existing water conservation program, status of implementation of DMMs, and projected future conservation implementation. The California Water Commission requires that UWMPs include a comprehensive description of historical, current, and projected water conservation programs.

*CWC 10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1) (A) ... a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measure that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

*(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

*(i) Water waste prevention ordinances.*

*(ii) Metering.*

*(iii) Conservation pricing.*

*(iv) Public education and outreach.*

*(v) Programs to assess and manage distribution system real loss.*

*(vi) Water conservation program coordination and staffing support.*

*(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

*(2) For an urban wholesale water supplier, as defined in Section 10608.12, (provide) a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.*

In previous UWMPs, a substantial amount of data was required to document a water supplier's progress in implementing fourteen specific DMMs. In 2014, Assembly Bill 2067 simplified, clarified, and updated reporting requirements for DMMs. Starting with this 2015 UWMP, focus has turned away from detailed descriptions of each of the fourteen DMMs and has turned to key water conservation measures that are being implemented to achieve compliance with SB X7-7. For retail agencies, the number of DMMs has been reduced from fourteen to six (plus an "other" category). For wholesalers, the number of DMMs was reduced to three specific measures (plus an "other" category), as well as a requirement for a narrative description of asset management and wholesale supplier assistance programs. A narrative description of the status of the DMMs and how the DMMs will help the water supplier achieve its SB X7-7 water use targets is required. Detailed data are not required.

Members of the California Urban Water Conservation Council (CUWCC) may include their reporting in the UWMP, but a narrative is also required.

The City has acknowledged the importance of water conservation and management, and has implemented significant water conservation efforts during the drought years of 1976-1977 and 1987-1992 in addition to maintaining ongoing conservation programs. In March 1990, the City Council approved a Water Conservation Program (Section 11-1.14 of Title XI of the Modesto Municipal Code) which combined a strong education program with watering restrictions and prohibition of water waste.

In 2011, the City developed a Water Conservation Plan, building upon the demand management measures and conservation strategies identified and documented in the 2010 UWMP. The City is currently in the process of developing an updated Conservation Plan, with the intent to better define the City's Conservation Program and to plan for conservation program implementation in the future. The City's goals are to conserve water through public relations, education, customer service, and enforcement. The City strives to meet this challenge by working in a friendly, respectful and positive manner with homeowners, businesses and property managers. In preparation of this Water Conservation Plan, the City developed the following policy statement, reflecting its belief in water conservation:

*To protect, conserve, and manage all water resources for the current and future needs of the community and the environment.*

The overall goal is to develop a system-wide water conservation plan containing acceptable water efficiency measures and an implementation plan which will decrease water use and water loss while using the most cost-effective methods.

A copy of the City's current Water Conservation Plan is provided in Appendix J.

#### 9.1 CITY OF MODESTO DEMAND MANAGEMENT MEASURES

The six retail agency DMMs required to be discussed in the 2015 UWMP include the following:

- Water waste prevention ordinances;
- Metering;
- Conservation pricing;
- Public education and outreach;
- Programs to assess and manage distribution system real loss; and
- Water conservation program coordination and staffing support.

For each DMM, the current program is described, followed by a description of how the DMM was implemented over the previous five years and the planned implementation to achieve the water use targets required by SB X7-7 (see *Chapter 5 SB X7-7 Baselines and Targets*).



#### 9.1.1 Water Waste Prevention Ordinances

Since 2002, the City has implemented the water waste prevention measures defined in Stage I of the City's Drought Contingency Plan (see Appendix I). Therefore, there have always been basic water conservation measures and varying degrees of water waste prevention enforced by the City. In April 2015, the City adopted Resolution 2015-134 revising the Water Shortage Contingency Plan and implementing Stage II of the Plan.

In November 2015, the City adopted Resolution 2015-455 implementing Stage IIA of the City's Drought Contingency Plan. Any violations of the rules and regulations established as part of Stage IIA of the Drought Contingency Plan are considered water waste. The rules and regulations for Stage IIA are as follows:

1. Outdoor water use prohibited Saturday and Sunday from 9:00 AM to 7:00 PM.
2. Odd-numbered addresses shall water outdoors only on Sundays.
3. Even-numbered addresses shall water outdoors only on Saturdays.
4. No outdoor water use is permitted on Monday through Friday.
5. City residents shall not wash cars without the use of a quick-acting positive shut-off nozzle or permit others to do so on their behalf. In addition, car washing must be done in compliance with the schedule for outdoor water use. There shall be no washing of building exteriors, mobile home exteriors, recreational vehicle exteriors, sidewalks, patios, driveways, gutters, or other exterior surfaces.
6. City residents shall not have leaky faucets or plumbing fixtures on their premises for more than 24 hours after the leak has been identified or notice has been received from the City, whichever comes first.
7. Eating establishments are required to serve water only at the customer's request.
8. New landscaping installations must comply with all applicable landscape ordinances.
9. The following penalties may be added to the utility service customer's account upon violation of the above regulations:
  - a) A penalty in the sum of \$150 upon the second violation within one year after having received a Notice of Violation.
  - b) A penalty of \$250 upon the third violation within said one-year period.
    - i) Upon the third violation within one year of having received a Notice of Violation, the resident shall also have a water meter installed if one is not present and metered billing shall commence.
  - c) A penalty of \$500 upon the fourth and any subsequent violations within said one-year period.
  - d) The customer shall be advised of these charges through a Notice of Intention to Impose a Penalty.

However, on April 26, 2016, the City decided to reinstate the Stage II requirements effective May 1, 2016 through October 31, 2016. Stage II allows for outdoor watering two days per week, but all other regulations listed above remain in effect under Stage II. Copies of the November 2015 and April 2016 Resolutions are included in Appendix I.

The City will continue to enforce its water waste ordinance by having the Utilities Department perform site visits. The effectiveness of this program will be evaluated based on the number of violations observed, as well as the overall demand reduction associated with invoking drought restrictions. Presently, the City's Utilities Department employs four part-time water patrols. They patrol during the summer hours enforcing outdoor water restrictions.

Implementation of this DMM is on-going and expected to help the City achieve its water use targets by minimizing the nonessential uses of water so that water is available to be used for human, consumption, sanitation, and fire protection.

#### 9.1.2 Metering

The City's water system is not yet fully metered. The City has been installing meters on new homes since the City Council enacted the Modesto Municipal Code 11-1 on May 14, 1991<sup>1</sup>, and in 2005 the City changed its water rate structure to include a volumetric rate charge. As of 2015, approximately 80 to 85 percent of the residential metering program is complete. All but one of the City's non-residential services are metered, and all new development in the City since 1991 has had meters installed.

In 2004, the California Legislature passed AB 2572, requiring all water suppliers to install water meters on all customer connections by January 1, 2025. The City is on track to convert all of the City's water system to metered accounts by 2020, and therefore satisfy the 2025 deadline.

Effectiveness of the metering program will be monitored by tracking the number of retrofits installed per year. By implementing the on-going meter installation and replacement program, the City is developing a more focused and direct monitoring tool allowing them to detect high water usages.

#### 9.1.3 Conservation Pricing

The City's current water rate structure is shown in Table 9-1. This rate structure encourages conserving behavior by incorporating a uniform volume charge in addition to the fixed meter charge for those customers who are metered. Consequently, water usage reductions directly reduce cost to the metered customer, while excessive water use results in increased costs. As described above, not all of the City's residential customers are currently metered. Unmetered residential

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<sup>1</sup> Though the City did start installing meters in 1991, these meters were not read for volumetric billing purposes and these homes remained on a flat rate billing method until 2005 when, as a result of AB 2572 mandating all homes to be metered by 2025, the City started installing meters on existing homes and changed its rate structure to bill metered homes on a volumetric basis.

## Chapter 9 Demand Management Measures



customers are billed based on a flat rate based on lot size. As customers become metered, they are converted from the flat rate charge to the metered charge.

**Table 9-1. City of Modesto Current Water Rates and Charges**

| Customer Class   | Rate <sup>(a)</sup> |
|--|---------------------|
| <b>Flat Rate Residential – Monthly Service Charges<sup>(b)</sup></b>                                 |                     |
| 0 –5,000 sq. ft. lot   | \$43.26             |
| 5,011 – 7,000 sq. ft. lot  | \$49.16             |
| 7,001 – 11,000 sq. ft. lot   | \$58.34             |
| 11,001 – 17,000 sq. ft. lot  | \$61.94             |
| Over 17,000 sq. ft. lot  | \$72.81             |
| <b>Metered Charges (Residential &amp; Commercial)</b>  |                     |
| Uniform Volume Charge (\$/hcf)   | \$1.40              |
| <b>Fixed Meter Charges</b>   |                     |
| 5/8" – 3/4"  | \$15.03             |
| 1"   | \$21.33             |
| 1 1/2"   | \$36.90             |
| 2"   | \$55.68             |
| 3"   | \$105.80            |
| 4"   | \$162.13            |
| 6"   | \$318.47            |
| 8"   | \$506.20            |
| 10"  | \$725.56            |
| 12"  | \$1,350.92          |
| <sup>(a)</sup> City of Modesto Current Water Rate (as of July 1, 2013) from City of Modesto website. |                     |
| <sup>(b)</sup> Flat rates shown include tax.   |                     |

The City is currently performing a water rate study to evaluate the potential effectiveness of different rate structures. Based on preliminary results of this study, the City has decided to not implement tiered rates at this time, but instead to implement a uniform surcharge to cover costs associated with a statewide mandate for water conservation. This surcharge would then end when the statewide water conservation mandate ends.

As required, the City will evaluate the need to readjust rates and/or rate structures in order to ensure continued compliance for this DMM. The City will evaluate the effectiveness of conservation rates by tracking changes in unit water use resulting from rate increases.

### 9.1.4 Public Education and Outreach

To promote water conservation, the City seeks to foster sustainable changes in behavior, not just temporary responses to drought. The purpose of the City’s water conservation program is to promote indoor and outdoor water conservation, as well as landscape ideas incorporating the use

of drought tolerant landscaping and irrigation systems. Water conservation information is distributed to the public through a variety of methods including personal contact, brochures, radio and television public service announcements, a dedicated conservation website, bill inserts, exhibits at community events, school presentations and videos. A water conservation telephone line is available to provide residents with any additional information they might request regarding water conservation.

The City has also coordinated with the media to better inform the public. Media coverage of the City's water conservation program is provided through public service announcements on television and radio in both English and Spanish, live interviews and taped cable television. Videotapes on water conservation and efficient landscaping practices are available from the Utilities Department, Water Services Division for use by the public. Copies of these tapes have also been donated to the Stanislaus County Library and several landscape nurseries in the City. In addition, the City's local newspaper, the *Modesto Bee*, also provides frequent and extensive coverage of current water conditions within the Modesto area.

The City has attended and promoted water conservation at the Stanislaus County Home and Garden show, Modesto Home Improvement Show, and Earth Day in the Park. At these events, the City provides conservation kits for both children and adults. There are three conservation kits the City distributes for different purposes. These include:

- Childs Water Conservation Kit
  - A Water Wise bag
  - BE WATER WISE coloring book with crayons and stickers
  - A NIAGARA water conservation “showering Coach” timer
  - Water conservation website links for parents
- Use Water Wisely Kit
  - Five Tips to Save Water bag
  - A Use Water Wise Wheel
  - Our World of Water activity book
  - 6” Use Water Wisely Ruler
  - Water Conservation website links
- Water Conservation Adult Kit
  - 15 Ways to Use Water Wisely bag
  - Leak detection dye tablets
  - Water Conservation slide guide
  - Use Water Wisely note pad.
  - Water Conservation Brochures
  - Water conservation website links

## Chapter 9

### Demand Management Measures

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On May 18, 2016, the Cities of Modesto, Ceres, Turlock, Manteca, and the UC Davis California Center of Urban Agriculture organized a landscape workshop in Modesto on how to maintain landscapes and reduce water waste through water management and system efficiency. At the workshop, attendees received indoor presentations and outdoor demonstrations on the following topics:

- Understanding precipitation rates to mitigate water and pesticide runoff;
- Improving sprinkler distribution uniformity to reduce water use;
- Improving controller programs to reduce and manage water use;
- Determining application rates and precipitation rates of drop/micro irrigation; and
- Understanding and reading water meters to improve irrigation efficiency.

In addition, City staff give school presentations to students at elementary schools in Modesto's service area each year. During these presentations, elementary school students are taught about the water cycle and water conservation, and receive Water Conservation Kits. The Water Conservation Coordinator has also met with school district principals to encourage participation in the program as it focuses on water conservation while incorporating state content standards. Two American Water Works Association (AWWA) publications, "Splash" and the "Story of Water," as well as the video "Water Follies," are used in conjunction with school programs and other community events. Elementary school students are particularly receptive to the conservation message and they share that message with their parents. Though fifth graders are targeted with the school presentations, similar presentations are given to junior and high school students upon request.

The City and MID will continue to implement the public education and outreach strategies as described above. Implementation of this DMM is expected to help the City achieve its water use targets by educating water users about the importance of improving water use efficiency and avoiding water waste.

#### 9.1.5 Programs to Assess and Manage Distribution System Real Loss

A water audit is a process of accounting for water use throughout a water system in order to quantify the unaccounted-for water. Unaccounted-for water is the difference between metered production and metered consumption on a system-wide basis. A leak detection program typically consists of both visual inspection as well as audible inspection. Visual inspection includes the inspection of distribution system appurtenances (e.g., fire hydrants, valves, meters, etc.) to identify obvious signs of leakage. To perform audible leak detection, specialized electronic listening equipment is used to detect the sounds associated with distribution system leakage. This process allows the agency to pinpoint the location of suspected leaks.

Repair and maintenance of the water distribution systems are priorities for the City. The City has Capital Improvement Projects that provide for maintenance programs that maximize efficiency of water distribution system operations and minimize water losses. These programs include using SCADA systems to monitor groundwater and surface water production, quick responses to water main leak detection and repair, recalibration of each well meter every four years, annual pump efficiency testing, and water quality efforts including main flushing and water quality testing.

## Chapter 9

### Demand Management Measures



Daily water production from the City's wells and the MRWTP is recorded and used to monitor water use. Additionally, the City maintains records of main breaks which are used to identify mains to be replaced and estimate system water loss. Water Line workers (four servicemen and one supervisor) are responsible for identifying excessive water waste, standing water and system leaks. At the customer's request, City staff will investigate and, where appropriate, repair leaks within the City's right-of-way. In addition, staff conducts repairs of water line leaks and replaces or repairs meters. A repair crew will repair leaks in areas where leak detection equipment has pinpointed hidden leaks.

Each year, 25 percent of well sites are serviced and meters are recalibrated as routine maintenance. Pump efficiency tests are completed annually. Repairs are promptly made on pumps showing decreased efficiency, and well meters found to be inaccurate or exhibiting signs of wear are promptly replaced. Well efficiency is consistently tracked through the City's SCADA System.

A Maintenance Avoidance Program was implemented in 1995 to analyze motor well vibration using a probe and recorder. This program allows the City to schedule maintenance on motors and pumps based on predictive trends calculated by the vibration analysis instruments. As a result, motors and pumps can be repaired or parts replaced before their complete failure, extending their useful life.

The City's Water Services Division uses Geographical Information Systems (GIS) and Global Positioning Systems (GPS) to record fire hydrant locations, valves, water meters, and map water lines of all water distribution systems. The GIS data is organized in a database of the water system. In conjunction with the data assembled through SCADA, the database aids in hydraulic modeling of the water system. The City uses CassWorks, a maintenance management system, to improve the efficiency of completing work orders, managing imported records and scheduling maintenance. In addition, the City's metered customers are able to use automatic meter reading (AMR) technology to help them detect leaks themselves. Leak reports and repairs are also logged in GIS to document and track the frequency of issues by location and to aid in identifying, planning, and prioritizing which areas need to be budgeted for water main and service line replacements. These programs are effective tools for providing customers with an efficiently operated and dependable water distribution system.

The City's Annual Pipe Replacement Program has City Engineering staff working with City Operations crews to identify old pipelines that are leaking, and provide follow-up in replacing those lines. The City's work on its Annual Pipe Replacement Program has allowed them to identify areas within its service area that are problematic with high percentages of leaking and repair frequency. A schedule and budget have been developed to systematically replace the pipes in these identified areas.

Concurrent with completion of the City's metering plan, implementation of this DMM is expected to help the City achieve its water use targets by identifying sources of water loss quickly so repairs can be made and losses minimized.

#### 9.1.6 Water Conservation Program Coordination and Staffing Support

A full-time water conservation coordinator position was authorized by the City Council and was filled in 2001. This position, also known as the “Water Conservation Specialist,” works in the City’s Water Quality Division. The Water Conservation Coordinator’s role is to develop, implement and manage the City’s water conservation program and to coordinate with on-going conservation programs in other departments and other agencies. Specifically, the Water Conservation Coordinator performs the following tasks:

- Runs school education outreach programs;
- Trains and directs activities of other staff assigned to water conservation functions;
- Provides conservation information to residents and commercial businesses, coordinates the development of uniform conservation policies and enforcement;
- Develops, recommends and maintains various media sources for providing conservation information to both internal and external customers;
- Plans, coordinates and administers various day-to-day activities pertaining to the City’s Water Conservation Program;
- Promotes the efficient use of the City’s water supply by residential, irrigation, industrial, commercial public agencies and other customers to ensure sufficient pressure throughout the system for fire protection and other essential City services; and
- Investigates and identifies compliance issues; and communicates with regulatory agencies as required.

The Conservation Coordinator also has an administrative office assistant and four to six temporary (seasonal) employees to help with the water conservation program. The administrative office assistant helps with phone calls, answers questions, and assists with the work flow of the temporary-seasonal employees. The seasonal employees help with water waste enforcement and public education. In addition, there are other staff members of the City’s Water Quality Division that help with conservation program tasks. However, these staff members are not specifically designated to the water conservation program.

The City will continue to keep the position of the Conservation Coordinator filled. The effectiveness of this program will be evaluated through the development of effective working relationships between conservation programs.

Implementation of this DMM is on-going and expected to help the City achieve its water use targets by making water conservation and implementation of the City’s water conservation program a priority among City employees.

## 9.2 OTHER CITY OF MODESTO DEMAND MANAGEMENT MEASURES

In addition to the six DMMs described above, the City implements the following programs:

- Residential conservation programs;
- Commercial, industrial, institutional customer conservation programs; and
- Large landscape irrigation conservation programs.

These programs are described below.

### 9.2.1 Residential Conservation Programs

Water surveys for residential users help raise awareness of water conservation in the home and help conserve water during everyday use. Program staff members are available to set sprinkler timers upon request, adjust sprinkler heads, and provide minor advice on sprinkler systems. Staff members agree that the small amount of extra time spent assisting customers creates goodwill, ultimately reducing the likelihood of enforcement staff having to return in the future. In the past, the City has offered these free services upon request

The City will identify the high water users in its service and focus on those areas; service technicians and/or City interns will visit the residential users to provide leak detection assistance by performing surveys that include both indoor and outdoor investigations and offer suggestions for both single-family and multi-family residences to improve water use efficiency. Surveys are offered via mailers, bill inserts and/or the City's website.

The City requires water efficient equipment to be installed in all new construction and remodels. In addition, Water Conservation Kits are distributed by the City through its Water Conservation Program. Conservation kits are also distributed after each water conservation presentation to both adults and children. Each kit contains one toilet displacement bag, dye tablets to detect toilet leaks, general conservation information, and installation instructions. When using the displacement bag in a standard toilet, approximately one gallon of water is saved with each flush. It is estimated that 20 percent of all toilets leak, and that the average leak wastes nearly 47 gallons a day. Using the dye tablet will help citizens detect those leaks. The water savings from using lawn watering guides is estimated to be 20 percent per household with automatic sprinklers and 10 percent for manual systems.

The City has implemented a formal rebate program to provide financial incentive for customers to meet the WaterSense Specification (WSS) Toilets. The City offers up to \$100 in rebates for customers that replace a less efficient (using more than 1.6 gallons per flush) with the purchase of a qualified high efficiency toilets (1.28 gallons per flush).

The City will also provide \$100 rebates to users towards the purchase of High Efficiency Clothes Washers (HECW) meeting the average WSS water factor value of 5.0 or better. As part of the implementation of this program, the City will develop and maintain a list of qualifying HECWs for residents to use.



## Chapter 9

### Demand Management Measures

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In addition to high efficiency toilets and clothes washer rebates, the City also provides rebates up to \$2,000 for residential turf replacement. Up to \$2 per square foot of removed and replaced turf can be rebated per eligible household.

The effectiveness of the residential water survey programs will be measured by monitoring the number of completed assistance requests. The effectiveness of the residential plumbing retrofit programs will be measured by monitoring the number of new residential establishments constructed with high efficiency equipment as well as the number of establishments remodeled with efficient equipment. In addition, the number of water conservation kits distributed will be tracked. The effectiveness of the high-efficiency washer program will be evaluated by tracking the number of requested and reimbursed rebates.

#### 9.2.2 Commercial, Industrial, Institutional Customers Conservation Programs

The City has provided water use audits to any Commercial Industrial and Institutional (CII) customer upon request as an informal service. The City implements two different strategies, one for new CII accounts and one for existing CII accounts. For new users, the City works to inform the user of potential wastewater saving measures by having them conduct a self-audit of their operations and equipment. This effort can save the user wastewater connection charges in addition to reducing their water consumption per square foot of operation. The City plans to develop tools and information sources to inform new CII customers of these potential savings. For existing CII users, a similar effort can be developed to display the economic savings through self-audits. It is estimated the savings on both the water and wastewater side will offset the cost of the self-audit in a short time. In the future, the City may have staff attend training that would increase their knowledge of such water saving measures. Currently, the City's Environmental Compliance Division, who handles wastewater discharge permits among other regulatory tasks, is instrumental in assisting larger CII users with water savings measures to reduce wastewater discharge impacts.

Under this program, the City will develop a formal survey program for CII accounts that will consist of free water use surveys (performed upon request) and evaluations of water using apparatus and processes, as well as recommended efficiency measures. Rebates will be provided for some water saving devices such as those included in the Table 9-2. In addition, CII accounts are able to take advantage of the City's turf replacement rebates discussed in Section 9.2.1 (Residential Conservation Programs). The City has also adopted the Commercial Green Building Code which requires higher water use efficiency standards (i.e., 20 percent reduction).

**Table 9-2. City of Modesto CII Rebate Programs**

| Device                                    | Incentive Amount |
|---|------------------|
| High Efficiency (HE) Toilets              | \$200            |
| HE Urinals                                | \$200            |
| Ultra Low Volume Urinals                  | \$200            |
| Zero Consumption Urinals                  | \$200            |
| Commercial HE Single Load Clothes Washers | \$200            |
| Cooling Tower Conductivity Controllers    | \$400            |
| Cooling Tower pH Controllers              | \$400            |
| Connectionless Food Steamers              | \$400            |
| Medical Equipment Steam Sterilizers       | \$400            |
| Water-Efficient Ice Machines              | \$250            |
| Pressurized Water Brooms                  | \$125            |
| Dry Vacuum Pumps                          | \$125            |

The effectiveness of the commercial application of the rebate programs will be evaluated by tracking the number of requested and reimbursed rebates.

### 9.2.3 Large Landscape Irrigation Conservation Programs

The City Utilities Department, Water Services Division has implemented an efficient  $ET_o$ -based irrigation system at eleven City parks. The  $ET_o$ -based irrigation systems involve irrigating parks using field computers connected by modem to a weather station. The weather station relays weather forecasts and evapotranspiration data to the field computers and the irrigation is adjusted according to incoming weather forecasts. Recently, the system has expanded to include more parks and public land. The City’s three certified landscape auditors oversee landscaping maintenance of the City’s parks and golf courses.

The City also strives to match water quality with use. For example, the shallower aquifers in the area are generally not tapped for potable water uses due to the presence of contaminants that require treatment. The City plans to convert older, shallower wells or develop new shallow wells to be used exclusively for park and school landscaping irrigation instead of using the treated surface and groundwater sources for these demands. This strategy serves as both a cost savings to the Parks Department and as a means by which available potable water supply sources can be conserved for potable uses. Irrigation conservation measures are still utilized at the parks, regardless of water source; but using the shallower water-bearing aquifer zones puts a supply to use that would otherwise go unused in highly urban areas.

In addition to the actions the City is already taking, the City has begun to formally offer surveys to large landscape accounts. Under this program, the City will visit customers who irrigate and recommend an efficient irrigation schedule and improvements. The City will provide each dedicated irrigation account with an  $ET_o$ -based water use budget equal to no more than an average of 70 percent of  $ET_o$  of annual average local  $ET_o$  per square foot of landscape area. The recreational

areas, such as parks, may require additional water than allotted in the budget, but their use still may not exceed 100 percent of  $ET_0$  on an annual basis.

To aid the customer in tracking their water use, the City will provide notices each billing cycle to the accounts with water use budgets showing the relationship between the budget and actual water consumption. The City will offer technical assistance to customers that are 20 percent over budget. In addition, the City will implement a weather-based irrigation controller (WBIC) rebate program, offering a \$50 rebate per WBIC purchased.

In December 2015, the City adopted the State of California's Model Water Efficient Landscape Ordinance (MWELO). The City plans to use MWELO until the City has time to revise its ordinance which is planned for summer 2016. The revisions will be minor changes that aim at simplifying the process for smaller landscape projects.

The effectiveness of this program will be evaluated by comparing water use at parks equipped with efficient,  $ET_0$ -based irrigation systems with water use at parks not equipped with irrigation systems. In addition, the City will track the increasing number of parks equipped with efficient irrigation systems and track the number of surveys and rebates for other large landscape customers.

### 9.3 MID DEMAND MANAGEMENT MEASURES

The four wholesale agency DMMs required to be discussed in the 2015 UWMP include the following:

- Metering;
- Public education and outreach;
- Water conservation program coordination and staffing support; and
- Other demand management measures.

In addition, a narrative of asset management and wholesale supplier assistance programs is required. For each DMM, the current program is described, followed by a description of how the DMM was implemented over the previous five years.

It should be noted that MID is primarily an agricultural water supplier and has prepared a 2015 AWMP Update (December 2015) which describes Efficient Water Management Practices (EWMPs) being implemented by MID in conjunction with its agricultural water system. As described further below, although MID is not directly involved in the City's implementation of urban water conservation measures, MID does support the City's water conservation efforts.

#### 9.3.1 Metering

Treated water supplies provided to the City by MID are metered by MID at the Terminal Reservoir Pump Station when in flow through mode and at the Treated Water Pump Station (TRPS) when in bypass mode. The meters are calibrated annually.

#### 9.3.2 Public Education and Outreach

Although MID does not directly provide public education and outreach for urban water use and conservation, MID provides the City with funding for the Save Our Water campaign advertising, and plans to assist the City in school educational programs described in Section 9.1.4 above.

#### 9.3.3 Water Conservation Program Coordination and Staff Support

MID is primarily an agricultural water supplier and has developed a Conservation Program to encourage landowners, through financial incentives, to invest in physical improvements and management practices that conserve water and improve water management. The long-term goal of the Conservation Program is the improve water management within MID. As described in MID's 2015 AWMP, MID has designated their Irrigation Operations Manager as their Water Conservation Coordinator.

However, MID's Water Conservation Coordinator does not focus on urban water conservation, as the City is responsible for implementing and managing the urban water conservation programs. However, MID staff coordinate regularly with City staff in support of the City's urban water conservation programs and the MID website ([www.mid.org](http://www.mid.org)) provides a link to the City's water conservation webpage.

#### 9.3.4 Other Demand Management Measures

MID does not implement any additional approaches to demand management for its urban customers.

#### 9.3.5 Asset Management

MID uses a Maintenance Management Program (MP2) to help manage and coordinate maintenance activities at its facilities. Routine preventive maintenance work, non-routine service, and work orders are tracked such that MID's Maintenance Supervisor can identify equipment issues that are starting to be problematic and proactively plan for replacement. MID generally does not replace equipment based on a manufacturer or industry recommended schedule as they have found that through an aggressive preventive maintenance program, the service life of most equipment can be significantly extended.

#### 9.3.6 Wholesale Supplier Assistance Programs

Although MID is not directly involved with urban water demand reduction, MID strongly supports the City's efforts through on-going and continuous coordination between MID and the City, support of water conservation and public outreach activities through MID's website and water use provisions contained in the October 2005 ARTDA between the City and MID.

There are two advisory committees that were formed to assist the Project Manager with the implementation of the Domestic Water Project. The Technical Committee, which meets monthly, is comprised of MID and City staff. The Policy Committee, which meets at least twice annually, is comprised two elected officials each from the MID Board and the City Council.

#### 9.4 PLANNED IMPLEMENTATION TO ACHIEVE WATER USE TARGETS

Water conservation measures are a vital part of the City and MID's overall plan to achieve, reliable, high quality, and cost-effective water supply for its customers. However, because MID does not have any direct urban customers, the City oversees the majority of the demand management measures and other public outreach activities. As described above, the City has implemented a number of water conservation measures that include, but are not limited to the following: public information outreach, water conservation kits, device incentive rebate programs, and water conservation partnerships. Additional information regarding the City's conservation activities is provided in Appendix J.

#### 9.5 MEMBERS OF THE CALIFORNIA URBAN WATER CONSERVATION COUNCIL

In 1991 (amended September 16, 1999), a Memorandum of Understanding (MOU) regarding urban water conservation in California was made that formalizes an agreement between DWR, water utilities, environmental organizations, and other interested groups to implement BMPs and make a cooperative effort to reduce the consumption of California's water resources. This MOU is administered by the CUWCC.

The Urban Water Management Planning Act (Water Code Section 10631(j)) allows for an urban retail water agency that is a signatory (member) of the CUWCC to meet the DMM requirements by documenting that the CUWCC has determined the urban water agency is complying (coverage) with all of the provisions of the MOU. However, neither the City of Modesto nor MID are signatories to the CUWCC MOU.

However, the City has implemented, or plans to implement, all of the BMPs, as defined in the CUWCC MOU. MID has also instituted a water conservation program which includes limiting water losses through the water conveyance systems, agricultural conservation programs and public information, etc. as reported in its 2015 AWMP. As described above, where feasible, the City and MID have participated in joint conservation programs.

These existing and proposed water conservation programs will assist the City in meeting the per capita water use targets required by SB X7-7 as discussed in *Chapter 5 SB X7-7 Baselines and Targets*.

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This chapter provides information regarding the notification, public hearings and adoption of the Plan.

**10.1 INCLUSION OF ALL 2015 DATA**

Because 2015 is the first compliance year for SB X7-7, the 2015 UWMPs must contain data through the end of 2015. If a water supplier bases its accounting on a fiscal year (July through June) the data must be presented through the end of the 2015 fiscal year (June 2015). If the water supplier bases its accounting on a calendar year, the data must be presented through the end of the 2015 calendar year (December 2015).

As indicated in Chapter 1, the City and MID use a calendar year for water supply and demand accounting, and therefore this 2015 UWMP includes data through December 2015.

**10.2 NOTICE OF PUBLIC HEARINGS**

The City and MID provided 60-day notice of the preparation of its 2015 UWMP, and notice of the 2015 UWMP Public Hearings to the cities and counties listed in Tables 10-1 and 10-2.

**Table 10-1. Retail: Notification to Cities and Counties (DWR Table 10-1 Retail)**

| City Name         | 60 Day Notice                       | Notice of Public Hearing            |
|-------------------|-------------------------------------|-------------------------------------|
| City of Turlock   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| City of Ceres     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| City of Modesto   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| County Name       | 60 Day Notice                       | Notice of Public Hearing            |
| Stanislaus County | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

**Table 10-2. Wholesale: Notification to Cities and Counties (DWR Table 10-1 Wholesale)**

|                                     |  |                                     |
|-------------------------------------|--|-------------------------------------|
| <input checked="" type="checkbox"/> | Supplier has notified 10 or fewer cities or counties.<br>Complete the table below. |                                     |
| City Name                           | 60 Day Notice  | Notice of Public Hearing            |
| City of Turlock                     | <input checked="" type="checkbox"/>  | <input checked="" type="checkbox"/> |
| City of Ceres                       | <input checked="" type="checkbox"/>  | <input checked="" type="checkbox"/> |
| City of Modesto                     | <input checked="" type="checkbox"/>  | <input checked="" type="checkbox"/> |
| County Name                         | 60 Day Notice  | Notice of Public Hearing            |
| Stanislaus County                   | <input checked="" type="checkbox"/>  | <input checked="" type="checkbox"/> |

In addition, the City and MID also notified other adjacent agencies, cities, and stakeholders including the following:

- Turlock Irrigation District
- Oakdale Irrigation District
- City of Waterford
- City of Riverbank
- City of Oakdale
- City of Patterson
- City of Newman

The City and MID each held public hearings for the 2015 UWMP on June 14, 2016. The public hearing notifications for adoption of the 2015 UWMP were published in the City’s local newspaper and on the City and MID websites. Copies of the public hearing notices are included in Appendix D.

### 10.3 PUBLIC HEARINGS AND ADOPTION

The City and MID have actively encouraged community and public interest involvement in the 2015 UWMP update through the use of mailings, public meetings, and web-based communication. Copies of the City and MID’s outreach efforts are included in Appendix D.

The public hearings provided an opportunity for all City and MID water customers and the general public to become familiar with the 2015 UWMP and ask questions about their existing water supply, in addition to the City’s and MID’s continuing plans for providing a reliable, safe, high-quality water supply. The adoption, implementation and economic impact of the revised per capita water use targets (described in Chapter 5) were also discussed at the public hearings. Copies of the Draft 2015 UWMP were made available for public review at the City’s Utilities Department



## Chapter 10

### Plan Adoption, Submittal, and Implementation



and at the MID Board Secretary's office, with an electronic version placed on the City and MID websites.

The Joint 2015 UWMP was adopted by both the Modesto City Council and by the MID Board of Directors at their respective meetings on \_\_\_\_\_. Copies of the City and MID adoption resolutions are provided in Appendix K.

#### 10.4 PLAN SUBMITTAL

A copy of this 2015 UWMP will be submitted to DWR within 30 days of adoption and by July 1, 2016. The adopted 2015 UWMP will be submitted electronically to DWR using the WUEdata submittal tool. A CD or hardcopy of the adopted 2015 UWMP will also be submitted to the California State Library.

No later than 30 days after adoption, a copy of the adopted 2015 UWMP, including the Water Shortage Contingency Plan, will be provided to the cities and counties to which the City provides water.

#### 10.5 PUBLIC AVAILABILITY

No later than 30 days after submittal to DWR, copies of the adopted 2015 UWMP will be made available to the public during normal business hours at the following locations:

- City of Modesto, Utilities Department, 1010 Tenth Street, 4<sup>th</sup> Floor, Modesto; and
- MID Board Secretary's Office, 1231 Eleventh Street, Modesto.

An electronic copy of the adopted 2015 UWMP will also be available on the City and MID websites:

- City of Modesto Utilities Department Website (<http://www.modestogov.com/uppd/reports/>)
- MID website (<http://www.mid.org/water/uwmp>)

#### 10.6 PLAN IMPLEMENTATION

Following adoption, this 2015 UWMP will be the source document for any Senate Bill 610 Water Supply Assessments or SB 221 Water Supply Verifications required for any proposed projects in the City's water service area between 2016 and 2020 that are subject to the California Environmental Quality Act and would demand an amount of water equivalent to or greater than the amount of water required by a 500 dwelling unit project. Lastly, this Plan will provide guidance and direction on development of new local water supplies and implementation of water conservation programs to meet the requirements of SB X7-7.

#### 10.7 AMENDING AN ADOPTED UWMP

If the City or MID amends its 2015 UWMP, copies of amendments or changes to the plans will be submitted to DWR, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

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## **APPENDIX A**

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### Legislative Requirements

- California Water Code – Urban Water Management Planning
- California Water Code – Sustainable Water Use and Demand Reduction

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# **California Water Code Urban Water Management Planning**

**California Water Code Division 6, Part 2.6.**

**Chapter 1. General Declaration and Policy §10610-10610.4**

**Chapter 2. Definitions §10611-10617**

**Chapter 3. Urban Water Management Plans**

Article 1. General Provisions §10620-10621

Article 2. Contents of Plans §10630-10634

Article 2.5. Water Service Reliability §10635

Article 3. Adoption And Implementation of Plans §10640-10645

**Chapter 4. Miscellaneous Provisions §10650-10656**

## **Chapter 1. General Declaration and Policy**

### **SECTION 10610-10610.4**

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

- (1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.
- (2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
- (3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.
- (4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.
- (5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
- (6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.
- (7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

## **Chapter 2. Definitions**

### SECTION 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses,

reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

## **Chapter 3. Urban Water Management Plans**

### **Article 1. General Provisions**

#### **SECTION 10620-10621**

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).
- (b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.
- (c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.
- (d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.
- (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that



share a common source, water management agencies, and relevant public agencies, to the extent practicable.

- (e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.
  - (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.
10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero, except as provided in subdivision (d).
- (b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.
  - (c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).
  - (d) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

## **Article 2. Contents of Plan**

### **SECTION 10630-10634**

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.
10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:
- (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.
  - (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of

water available to the supplier, all of the following information shall be included in the plan:

- (1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.
  - (2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.
  - (3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.
  - (4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.
- (c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:
- (A) An average water year.
  - (B) A single-dry water year.
  - (C) Multiple-dry water years.
- (2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

- (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.
- (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:
  - (A) Single-family residential.
  - (B) Multifamily.
  - (C) Commercial.
  - (D) Industrial.
  - (E) Institutional and governmental.
  - (F) Landscape.
  - (G) Sales to other agencies.
  - (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
  - (I) Agricultural.
  - (J) Distribution system water loss.
- (2) The water use projections shall be in the same five-year increments described in subdivision (a).
- (3) (A) For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.
  - (B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.
- (4) (A) If available and applicable to an urban water supplier, water use projections may display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(g) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water

use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

- (h) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
- (i) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivision (f) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.
- (j) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

- (b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan may, but is not required to, include any of the following information:

- (1) An estimate of the amount of energy used to extract or divert water supplies.
- (2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
- (3) An estimate of the amount of energy used to treat water supplies.
- (4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
- (5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
- (6) An estimate of the amount of energy used to place water into or withdraw from storage.
- (7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

- (2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).
- (3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has

submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

- (i) Compliance on an individual basis.
  - (ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.
- (B) The department may require additional information for any determination pursuant to this section.
- (3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.
- (c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).
  - (d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.
  - (e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.



- (f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:
- (1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.
  - (2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.
  - (3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.
  - (4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
  - (5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are

appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

- (6) Penalties or charges for excessive use, where applicable.
  - (7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.
  - (8) A draft water shortage contingency resolution or ordinance.
  - (9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.
- (b) Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

- (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
- (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
- (c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.
- (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

- (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.
- (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.
- (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

## **Article 2.5. Water Service Reliability**

### **SECTION 10635**

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.
- (b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.
- (c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

- (d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

### **Article 3. Adoption and Implementation of Plans**

#### **SECTION 10640-10645**

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.

After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

- (b) (1) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part.

The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

- (2) A report to be submitted pursuant to paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

- (c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section 10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

- (2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

- (3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

## **Chapter 4. Miscellaneous Provisions**

### **SECTION 10650-10656**

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

- (a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

- (b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.
10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.
10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.
10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.
10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.
10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.
10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26

(commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

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# **California Water Code Sustainable Water Use and Demand Reduction**

**California Water Code Division 6, Part 2.55.**

- Chapter 1. General Declarations and Policy §10608-10608.8**
- Chapter 2. Definitions §10608.12**
- Chapter 3. Urban Retail Water Suppliers §10608.16-10608.44**
- Chapter 4. Agricultural Water Suppliers §10608.48**
- Chapter 5. Sustainable Water Management §10608.50**
- Chapter 6 Standardized Data Collection §10608.52**
- Chapter 7 Funding Provisions §10608.56-10608.60**
- Chapter 8 Quantifying Agricultural Water Use Efficiency §10608.64**

## **Chapter 1. General Declarations and Policy**

### SECTION 10608-10608.8

10608. The Legislature finds and declares all of the following:

- (a) Water is a public resource that the California Constitution protects against waste and unreasonable use.
- (b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.
- (c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.
- (d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.
- (e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.
- (f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.
- (g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.
- (h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

- (i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

- (a) Require all water suppliers to increase the efficiency of use of this essential resource.
- (b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.
- (c) Measure increased efficiency of urban water use on a per capita basis.
- (d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.
- (e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.
- (f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.
- (g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.
- (h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.
- (i) Require implementation of specified efficient water management practices for agricultural water suppliers.
- (j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.
- (k) Advance regional water resources management.

- 10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.
- (2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to

January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

- (3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.
- (b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.
- (c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.
- (d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

## Chapter 2 Definitions

### SECTION 10608.12

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

- (a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.
- (b) "Base daily per capita water use" means any of the following:
  - (1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

- (2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.
  - (3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.
- (c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.
  - (d) "Commercial water user" means a water user that provides or distributes a product or service.
  - (e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.
  - (f) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.
  - (g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:
    - (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.
    - (2) The net volume of water that the urban retail water supplier places into long-term storage.
    - (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.
    - (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.
  - (h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.
  - (i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

- (j) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.
- (k) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.
- (l) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.
- (m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:
  - (1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:
    - (A) Metered.
    - (B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.
    - (C) Treated to a minimum tertiary level.
    - (D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.
  - (2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.
- (n) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:
  - (1) The capture and reuse of stormwater or rainwater.
  - (2) The use of recycled water.
  - (3) The desalination of brackish groundwater.

- (4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.
- (o) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.
- (p) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.
- (q) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.
- (r) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

## **Chapter 3 Urban Retail Water Suppliers**

### SECTION 10608.16-10608.44

10608.16.(a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

- (b) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20.(a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

- (2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

- (b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

- (1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

- (2) The per capita daily water use that is estimated using the sum of the following performance standards:

- (A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.
  - (B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.
  - (C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.
- (3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.
- (4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:
- (A) Consider climatic differences within the state.
  - (B) Consider population density differences within the state.
  - (C) Provide flexibility to communities and regions in meeting the targets.
  - (D) Consider different levels of per capita water use according to plant water needs in different regions.
  - (E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.
  - (F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.
- (c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method



described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

- (d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.
- (e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.
- (f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.
- (g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).
- (h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:
  - (A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.
  - (B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.
- (2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its Internet Web site, and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.
- (i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with subdivision (l) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.
- (2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the

Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

- (j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.
- (2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph(3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

10608.24.(a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

- (b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.
- (c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.
- (d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:
  - (A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.
  - (B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.
  - (C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.
- (2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in

paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

- (e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.
- (f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.  
  
(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26.(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

- (1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.
  - (2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.
  - (3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.
- (b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.
- (c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the conservation of that military installation under federal Executive Order 13514.
- (d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit

an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

- (2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28.(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

- (1) Through an urban wholesale water supplier.
- (2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).
- (3) Through a regional water management group as defined in Section 10537.
- (4) By an integrated regional water management funding area.
- (5) By hydrologic region.
- (6) Through other appropriate geographic scales for which computation methods have been developed by the department.

- (b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans

submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42.(a) The department shall review the 2015 urban water management plans and report to the Legislature by July 1, 2017, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

(b) A report to be submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.

(b) Evaluation of water demands for manufacturing processes, goods, and cooling.

(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.

(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.

(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use at facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

## Chapter 4 Agricultural Water Suppliers

### SECTION 10608.48

10608.48.(a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement all of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

- (6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.
  - (7) Construct and operate supplier spill and tailwater recovery systems.
  - (8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.
  - (9) Automate canal control structures.
  - (10) Facilitate or promote customer pump testing and evaluation.
  - (11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.
  - (12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:
    - (A) On-farm irrigation and drainage system evaluations.
    - (B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.
    - (C) Surface water, groundwater, and drainage water quantity and quality data.
    - (D) Agricultural water management educational programs and materials for farmers, staff, and the public.
  - (13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.
  - (14) Evaluate and improve the efficiencies of the supplier's pumps.
- (d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.
- (e) The data shall be reported using a standardized form developed pursuant to Section 10608.52.
- (f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

- (g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.
- (h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.
- (i)
  - (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).
  - (2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

## **Chapter 5 Sustainable Water Management**

### Section 10608.50

- 10608.50.(a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:
- (1) Revisions to the requirements for urban and agricultural water management plans.
  - (2) Revisions to the requirements for integrated regional water management plans.
  - (3) Revisions to the eligibility for state water management grants and loans.



- (4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.
  - (5) Increased funding for research, feasibility studies, and project construction.
  - (6) Expanding technical and educational support for local land use and water management agencies.
- (b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

## **Chapter 6 Standardized Data Collection**

### SECTION 10608.52

- 10608.52.(a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.
- (b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

## **Chapter 7 Funding Provisions**

### Section 10608.56-10608.60

- 10608.56.(a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.
- (b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

- (c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.
- (d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.
- (e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.
- (f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60.(a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

- (b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

## **Chapter 8 Quantifying Agricultural Water Use Efficiency**

### SECTION 10608.64

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

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## **APPENDIX B**

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DWR 2015 Urban Water Management Plan Tables

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**Table 2-1 Retail Only: Public Water Systems** <sup>(a,b)</sup>

| Public Water System Number | Public Water System Name | Number of Municipal Connections 2015 | Volume of Water Supplied 2015 |
|----------------------------|--------------------------|--------------------------------------|-------------------------------|
| CA5010010 <sup>(c)</sup>   | City of Modesto          | 69,152                               | 45,544                        |
| CA5010005 <sup>(d)</sup>   | Salida                   | 4,399                                | 909                           |
| CA5010031                  | Ceres (Walnut Manor)     | 53                                   | 44                            |
| CA5010033                  | Grayson                  | 274                                  | 162                           |
| CA5010029                  | Del Rio (Hillcrest)      | 389                                  | 577                           |
| CA5010034                  | North Turlock            | 52                                   | 31                            |
| CA5010023                  | South Turlock            | 332                                  | 192                           |
| CA5010035 <sup>(e)</sup>   | Central Turlock          | 35                                   | 0                             |
| <b>TOTAL</b>               |                          | <b>74,686</b>                        | <b>47,459</b>                 |

**NOTES:**

(a) Represents available services (includes billed and unbilled accounts).

(b) Represents water production (AF).

(c) Includes Empire and North Ceres services that are contiguous to the City of Modesto water system (interconnected).

(d) Salida is contiguous to the City of Modesto water system (interconnected).

(e) No SCADA available for production because City of Turlock provides groundwater to this system via an interconnection with Turlock.

**Table 2-2: Plan Identification**

| Select Only One                     | Type of Plan                                 | Name of RUWMP or Regional Alliance<br><i>if applicable</i> |
|-------------------------------------|--|--|
| <input checked="" type="checkbox"/> | Individual UWMP                              |  |
| <input type="checkbox"/>            | Regional Urban Water Management Plan (RUWMP) |  |
| NOTES:                              |  |  |



| Table 2-3: Agency Identification                      |                                   |
|---|-----------------------------------|
| Type of Agency (select one or both)                   |                                   |
| <input checked="" type="checkbox"/>                   | Agency is a wholesaler            |
| <input checked="" type="checkbox"/>                   | Agency is a retailer              |
| Fiscal or Calendar Year (select one)                  |                                   |
| <input checked="" type="checkbox"/>                   | UWMP Tables Are in Calendar Years |
| <input type="checkbox"/>                              | UWMP Tables Are in Fiscal Years   |
| Units of Measure Used in UWMP (select from Drop down) |                                   |
| Unit  | AF                                |
| NOTES:  |                                   |

|  |
|--|
| <b>Table 2-4 Retail: Water Supplier Information Exchange</b> |
|--|

|   |
|---|
| The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631. |
|---|

|                               |
|-------------------------------|
| Wholesale Water Supplier Name |
|-------------------------------|

|                                   |
|-----------------------------------|
| Modesto Irrigation District (MID) |
|-----------------------------------|

|        |
|--------|
| NOTES: |
|--------|

**Table 2-4 Wholesale: Water Supplier Information Exchange (select one)**

|                                     |  |
|-------------------------------------|--|
| <input type="checkbox"/>            | Supplier has informed more than 10 other water suppliers of water supplies available in accordance with CWC 10631. Completion of the table below is optional. If not completed include a list of the water suppliers that were informed. |
|                                     | <b>Provide page number for location of the list.</b>   |
| <input checked="" type="checkbox"/> | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631.<br><b>Complete the table below.</b>  |
| Water Supplier Name                 |  |
| City of Modesto                     |  |
|                                     |  |
|                                     |  |
| NOTES:                              |  |

**Table 3-1 Retail: Population - Current and Projected**

| Population Served | 2015    | 2020    | 2025    | 2030    | 2035    | 2040(opt) |
|-------------------|---------|---------|---------|---------|---------|-----------|
|                   | 259,187 | 274,920 | 291,686 | 309,555 | 328,599 | 348,896   |

NOTES: 2015 population from California Department of Finance where available and projected populations are based on the City of Modesto Water Master Plan (refer to Table 3-1 in the Water Master Plan). Does not include population from Hickman and Waterford.

| Table 3-1 Wholesale: Population - Current and Projected   |      |      |      |      |      |           |
|---|------|------|------|------|------|-----------|
| Population Served   | 2015 | 2020 | 2025 | 2030 | 2035 | 2040(opt) |
|   | 0    | 0    | 0    | 0    | 0    | 0         |
| NOTES: MID does not directly serve any urban water customers. The population served by MID wholesale water is included the City's total service area population (see DWR Table 3-1 Retail). |      |      |      |      |      |           |

**Table 4-1 Retail: Demands for Potable and Raw Water - Actual**

| Use Type   | 2015 Actual                                  |                                      |               |
|--|--|--------------------------------------|---------------|
|  | Additional Description<br><i>(as needed)</i> | Level of Treatment<br>When Delivered | Volume        |
| Single Family  |  | Drinking Water                       | 20,203        |
| Multi-Family   |  | Drinking Water                       | 4,710         |
| Commercial   |  | Drinking Water                       | 7,537         |
| Industrial   |  | Drinking Water                       | 2,728         |
| Institutional/Governmental   |  | Drinking Water                       | 1,486         |
| Landscape  |  | Drinking Water                       | 1,744         |
| Other  | Unmetered water uses                         | Drinking Water                       | 4,305         |
| Losses   |  | Drinking Water                       | 4,746         |
| <b>TOTAL</b>   |  |                                      | <b>47,459</b> |
| NOTES: Volumes are in AF; volumes do not include demands from Hickman and Waterford. |  |                                      |               |

**Table 4-1 Wholesale: Demands for Potable and Raw Water - Actual**

| Use Type                  | 2015 Actual                                  |                                      |        |
|---------------------------|--|--------------------------------------|--------|
|                           | Additional Description<br><i>(as needed)</i> | Level of Treatment<br>When Delivered | Volume |
| Sales to other agencies   | City of Modesto                              | Drinking Water                       | 15,401 |
| Losses                    |  | Drinking Water                       | 31     |
| <b>TOTAL</b>              |  |                                      | 15,432 |
| NOTES: Volumes are in AF. |  |                                      |        |

**Table 4-2 Retail: Demands for Potable and Raw Water - Projected**

| Use Type                   | Additional Description<br><i>(as needed)</i> | Projected Water Use |               |               |               |               |
|----------------------------|--|---------------------|---------------|---------------|---------------|---------------|
|                            |  | 2020                | 2025          | 2030          | 2035          | 2040-opt      |
| Single Family              |  | 35,873              | 38,681        | 41,489        | 44,297        | 47,106        |
| Multi-Family               |  | 6,894               | 7,434         | 7,974         | 8,514         | 9,053         |
| Commercial                 |  | 11,032              | 11,895        | 12,759        | 13,622        | 14,486        |
| Industrial                 |  | 3,993               | 4,306         | 4,618         | 4,931         | 5,243         |
| Institutional/Governmental |  | 2,174               | 2,345         | 2,515         | 2,685         | 2,855         |
| Landscape                  |  | 2,553               | 2,753         | 2,953         | 3,153         | 3,353         |
| Other                      | Unmetered water uses                         | 0                   | 0             | 0             | 0             | 0             |
| Losses                     |  | 6,947               | 7,490         | 8,034         | 8,578         | 9,122         |
| <b>TOTAL</b>               |  | <b>69,466</b>       | <b>74,904</b> | <b>80,342</b> | <b>85,780</b> | <b>91,218</b> |

NOTES: Volumes are in AF. Projected water use is based on the City of Modesto Water Master Plan.



**Table 4-2 Wholesale: Demands for Potable and Raw Water - Projected**

| Use Type   | Additional Description<br><i>(as needed)</i> | Projected Water Use |        |        |        |                   |
|--|--|---------------------|--------|--------|--------|-------------------|
|  |  | 2020                | 2025   | 2030   | 2035   | 2040 <i>(opt)</i> |
| Sales to other agencies  | City of Modesto                              | 44,800              | 48,533 | 52,267 | 56,000 | 59,733            |
| <b>TOTAL</b>   |  | 44,800              | 48,533 | 52,267 | 56,000 | 59,733            |
| NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan). |  |                     |        |        |        |                   |

| Table 4-3 Retail: Total Water Demands |        |        |        |        |        |                      |
|---------------------------------------|--------|--------|--------|--------|--------|----------------------|
|                                       | 2015   | 2020   | 2025   | 2030   | 2035   | 2040<br><i>(opt)</i> |
| Potable and Raw Water                 | 47,459 | 69,466 | 74,904 | 80,342 | 85,780 | 91,218               |
| Recycled Water Demand                 | 0      | 0      | 0      | 0      | 0      | 0                    |
| <b>TOTAL WATER DEMAND</b>             | 47,459 | 69,466 | 74,904 | 80,342 | 85,780 | 91,218               |
| NOTES: Volumes are in AF.             |        |        |        |        |        |                      |

**Table 4-3 Wholesale: Total Water Demands**

|                           | 2015   | 2020   | 2025   | 2030   | 2035   | 2040( <i>opt</i> ) |
|---------------------------|--------|--------|--------|--------|--------|--------------------|
| Potable and Raw Water     | 15,432 | 44,800 | 48,533 | 52,267 | 56,000 | 59,733             |
| Recycled Water Demand     | 0      | 0      | 0      | 0      | 0      | 0                  |
| <b>TOTAL WATER DEMAND</b> | 15,432 | 44,800 | 48,533 | 52,267 | 56,000 | 59,733             |

NOTES: Volumes are in AF.

| Table 4-4 Retail: 12 Month Water Loss Audit Reporting   |                       |
|---|-----------------------|
| Reporting Period Start Date   | Volume of Water Loss* |
| 01/2015   | 4,746                 |
| * Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. |                       |
| NOTES: Volumes are in AF. A copy of the City of Modesto's 2015 Water Audit is provided in Appendix E.             |                       |

**Table 4-4 Wholesale: 12 Month Water Loss Audit Reporting**

| Reporting Period Start Date | Volume of Water Loss* |
|-----------------------------|-----------------------|
| 01/2015                     | 31                    |

*\* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*

NOTES: Volumes are in AF. A copy of MID's 2015 Water Audit is provided in Appendix E.

**Table 4-5 Retail Only: Inclusion in Water Use Projections**

|   |     |
|---|-----|
| Are Future Water Savings Included in Projections?             | No  |
| Are Lower Income Residential Demands Included In Projections? | Yes |
| NOTES:  |     |

| <b>Table 5-1 Baselines and Targets Summary</b>  |            |          |                        |                       |                        |
|---|------------|----------|------------------------|-----------------------|------------------------|
| <i>Retail Agency or Regional Alliance Only</i>  |            |          |                        |                       |                        |
| Baseline Period   | Start Year | End Year | Average Baseline GPCD* | 2015 Interim Target * | Confirmed 2020 Target* |
| 10-15 year  | 1999       | 2008     | 285                    | 257                   | 228                    |
| 5 Year  | 2003       | 2007     | 279                    |                       |                        |
| *All values are in Gallons per Capita per Day (GPCD)  |            |          |                        |                       |                        |
| NOTES: Historical per capita use from Hickman and Waterford are not included in calculations. |            |          |                        |                       |                        |

| Table 5-2: 2015 Compliance<br>Retail Agency or Regional Alliance Only                         |                                    |  |                         |                           |                       |   |   |
|---|------------------------------------|--|-------------------------|---------------------------|-----------------------|---|---|
| Actual<br>2015 GPCD *   | 2015<br>Interim<br>Target<br>GPCD* | Optional Adjustments to 2015 GPCD<br><i>From Methodology 8</i> |                         |                           |                       | 2015 GPCD*<br><i>(Adjusted if<br/>applicable)</i> | Did Supplier<br>Achieve<br>Targeted<br>Reduction for<br>2015? Y/N |
|   |                                    | Extraordinary<br>Events*                                       | Economic<br>Adjustment* | Weather<br>Normalization* | TOTAL<br>Adjustments* |   |   |
| 163   | 257                                | 0  | 0                       | 0                         | 0                     | 163   | Yes   |
| *All values are in Gallons per Capita per Day (GPCD)  |                                    |  |                         |                           |                       |   |   |
| NOTES: Historical per capita use from Hickman and Waterford are not included in calculations. |                                    |  |                         |                           |                       |   |   |



**Table 6-1 Retail: Groundwater Volume Pumped**

| Table 6-1 Retail: Groundwater Volume Pumped |  |        |        |        |        |        |
|---|--|--------|--------|--------|--------|--------|
| <input type="checkbox"/>                    | Supplier does not pump groundwater.<br>The supplier will not complete the table below. |        |        |        |        |        |
| Groundwater Type                            | Location or Basin Name   | 2011   | 2012   | 2013   | 2014   | 2015   |
| Alluvial Basin                              | San Joaquin Valley Groundwater Basin   | 34,897 | 31,380 | 29,773 | 36,415 | 32,058 |
| <b>TOTAL</b>                                |  | 34,897 | 31,380 | 29,773 | 36,415 | 32,058 |

NOTES: Volumes are in AF. Historical groundwater volumes do not include production from Hickman and Waterford.

**Table 6-1 Wholesale: Groundwater Volume Pumped**

| <input checked="" type="checkbox"/> | Supplier does not pump groundwater.<br>The supplier will not complete the table below. |      |      |      |      |      |
|-------------------------------------|--|------|------|------|------|------|
| Groundwater Type                    | Location or Basin Name   | 2011 | 2012 | 2013 | 2014 | 2015 |
| <b>TOTAL</b>                        |  | 0    | 0    | 0    | 0    | 0    |
| NOTES:                              |  |      |      |      |      |      |

**Table 6-2 Retail: Wastewater Collected Within Service Area in 2015**

| <input type="checkbox"/> There is no wastewater collection system. The supplier will not complete the table below. |   |  |  |   |                                   |   |
|--|---|--|--|---|-----------------------------------|---|
| Percentage of 2015 service area covered by wastewater collection system (optional)                                 |   |  |  |   |                                   |   |
| Percentage of 2015 service area population covered by wastewater collection system (optional)                      |   |  |  |   |                                   |   |
| Wastewater Collection  |   |  |  | Recipient of Collected Wastewater               |                                   |   |
| Name of Wastewater Collection Agency   | Wastewater Volume Metered or Estimated? | Volume of Wastewater Collected from UWMP Service Area 2015 | Name of Wastewater Treatment Agency Receiving Collected Wastewater | Treatment Plant Name                            | Is WWTP Located Within UWMP Area? | Is WWTP Operation Contracted to a Third Party? (optional) |
| City of Modesto  | Metered                                 | 24,152   | City of Modesto  | Sutter Avenue Primary Treatment Plant           | Yes                               |   |
| City of Modesto  | Metered                                 | 2,995  | City of Modesto  | Jennings Road Treatment Plant                   | No                                |   |
| Salida Sanitary Sewer District   | Metered                                 | 1,283  | Salida Sanitary Sewer District                                     | Salida Sanitary Treatment Plant                 | No                                |   |
| Grayson Community Services District  | Estimated                               | 86   | Grayson Community Services District                                | Grayson WWTP                                    | No                                |   |
| Del Rio  | Estimated                               | 92   | Septic systems and Package plant                                   | N/A   | No                                |   |
| City of Turlock  | Estimated                               | 101  | City of Turlock  | Turlock Regional Water Quality Control Facility | No                                |   |
| <b>Total Wastewater Collected from Service Area in 2015:</b>   |   | <b>28,709</b>  |  |   |                                   |   |

NOTES: Volumes are in AF.

**Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015**

| No wastewater is treated or disposed of within the UWMWP service area. The supplier will not complete the table below. |                                       |                                |   |                    |  |                          |                    |                               |                              |                                  |
|--|---------------------------------------|--------------------------------|---|--------------------|--|--------------------------|--------------------|-------------------------------|------------------------------|----------------------------------|
| Wastewater Treatment Plant Name  | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number (optional) | Method of Disposal | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level          | Wastewater Treated | 2015 volumes                  |                              |                                  |
|  |                                       |                                |   |                    |  |                          |                    | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area |
| City of Modesto Sutter Avenue Primary Treatment Plant  | N/A                                   | N/A                            |   | Other              | No   | Secondary, Undisinfected | 24,152             | 0                             | 0                            | 0                                |
| <b>Total</b>   |                                       |                                |   |                    |  |                          | 24,152             | 0                             | 0                            | 0                                |

NOTES: Volumes are in AF. The Sutter Avenue Primary Treatment Plant provides primary treatment only.

**Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2015**

| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number <i>(optional)</i> | Method of Disposal | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level | 2015 volumes       |                               |                              |                                  |   |  |
|---------------------------------|---------------------------------------|--------------------------------|--|--------------------|--|-----------------|--------------------|-------------------------------|------------------------------|----------------------------------|---|--|
|                                 |                                       |                                |  |                    |  |                 | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area |   |  |
|                                 |                                       |                                |  |                    |  |                 |                    |                               |                              |                                  |   |  |
|                                 |                                       |                                |  |                    |  |                 |                    |                               |                              |                                  |   |  |
|                                 |                                       |                                |  |                    |  |                 |                    |                               |                              |                                  |   |  |
|                                 |                                       |                                |  |                    |  |                 |                    |                               |                              |                                  |   |  |
| <b>Total</b>                    |                                       |                                |  |                    |  |                 | 0                  | 0                             | 0                            | 0                                | 0 |  |

NOTES:

**Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area**

|   |                     |                                  |                    |      |      |      |      |      |            |   |
|---|---------------------|----------------------------------|--------------------|------|------|------|------|------|------------|---|
| <input checked="" type="checkbox"/> Recycled water is not used and is not planned for use within the service area of the supplier.<br>The supplier will not complete the table below. |                     |                                  |                    |      |      |      |      |      |            |   |
| Name of Agency Producing (Treating) the Recycled Water:   |                     |                                  |                    |      |      |      |      |      |            |   |
| Name of Agency Operating the Recycled Water Distribution System:  |                     |                                  |                    |      |      |      |      |      |            |   |
| Supplemental Water Added in 2015  |                     |                                  |                    |      |      |      |      |      |            |   |
| Source of 2015 Supplemental Water   |                     |                                  |                    |      |      |      |      |      |            |   |
|   | Beneficial Use Type | General Description of 2015 Uses | Level of Treatment | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 (opt) |   |
|   |                     |                                  | <b>Total:</b>      | 0    | 0    | 0    | 0    | 0    | 0          | 0 |
| *IPR - Indirect Potable Reuse   |                     |                                  |                    |      |      |      |      |      |            |   |
| NOTES:  |                     |                                  |                    |      |      |      |      |      |            |   |

**Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area**

| <input checked="" type="checkbox"/>                    | Recycled water is not directly treated or distributed by the supplier.<br>The supplier will not complete the table below. |      |      |      |      |      | The                 |
|--|---|------|------|------|------|------|---------------------|
| Name of Receiving Supplier or Direct Use by Wholesaler | Level of Treatment  | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 ( <i>opt</i> ) |
| <b>Total</b>   |   | 0    | 0    | 0    | 0    | 0    | 0                   |
| NOTES:   |   |      |      |      |      |      |                     |

**Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual**

| □   | Recycled water was not used in 2010 nor projected for use in 2015.<br>The supplier will not complete the table below. |                 |
|---|---|-----------------|
| Use Type  | 2010 Projection for 2015  | 2015 Actual Use |
| Agricultural irrigation   | 9,100   | 0               |
| <b>Total</b>  | 9,100   | 0               |
| NOTES: Volumes are in AF. There was no recycled water use within the City's water service area in 2015. |   |                 |



**Table 6-5 Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual**

| <input checked="" type="checkbox"/>                    | Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015.<br>The wholesale supplier will not complete the table below. |                 |
|--|---|-----------------|
| Name of Receiving Supplier or Direct Use by Wholesaler | 2010 Projection for 2015  | 2015 actual use |
| None   | 0   | 0               |
| <b>Total</b>   | 0   | 0               |
| NOTES:   |   |                 |

**Table 6-6 Retail: Methods to Expand Future Recycled Water Use**

| <input checked="" type="checkbox"/> | Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation. |                             |   |
|-------------------------------------|---|-----------------------------|---|
| Page 6-20                           | Provide page location of narrative in UWMP  |                             |   |
| Name of Action                      | Description   | Planned Implementation Year | Expected Increase in Recycled Water Use |
| <b>Total</b>                        |   |                             | 0                                       |
| NOTES:                              |   |                             |   |

**Table 6-7 Retail: Expected Future Water Supply Projects or Programs**

No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.

Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.

Provide page location of narrative in the UWMP

| Name of Future Projects or Programs | Joint Project with other agencies? | Description (if needed) | Planned Implementation Year | Planned for Use in Year Type | Expected Increase in Water Supply to Agency |
|-------------------------------------|------------------------------------|-------------------------|-----------------------------|------------------------------|---|
|                                     |                                    |                         |                             |                              |   |
|                                     |                                    |                         |                             |                              |   |
|                                     |                                    |                         |                             |                              |   |

NOTES:

**Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs**

| <input checked="" type="checkbox"/> | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. |  |                                   |                             |                              |   |
|-------------------------------------|---|--|-----------------------------------|-----------------------------|------------------------------|---|
| <input type="checkbox"/>            | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.                  |  |                                   |                             |                              |   |
|                                     | Provide page location of narrative in the UWMP  |  |                                   |                             |                              |   |
| Name of Future Projects or Programs | Joint Project with other agencies?  |  | Description<br><i>(if needed)</i> | Planned Implementation Year | Planned for Use in Year Type | Expected Increase in Water Supply to Agency |
|                                     |   |  |                                   |                             |                              |   |
|                                     |   |  |                                   |                             |                              |   |
|                                     |   |  |                                   |                             |                              |   |
|                                     |   |  |                                   |                             |                              |   |
| NOTES:                              |   |  |                                   |                             |                              |   |

**Table 6-8 Retail: Water Supplies — Actual**

| Table 6-8 Retail: Water Supplies — Actual                                      |                                   |               |                |                                      |
|--|-----------------------------------|---------------|----------------|--------------------------------------|
| Water Supply   | Additional Detail on Water Supply | 2015          |                |                                      |
|  |                                   | Actual Volume | Water Quality  | Total Right or Safe Yield (optional) |
| Purchased or Imported Water  | Purchases from MID                | 15,401        | Drinking Water |                                      |
| Groundwater  |                                   | 32,058        | Drinking Water |                                      |
| <b>Total</b>   |                                   | 47,459        |                | 0                                    |
| NOTES: Volumes are in AF. Does not include supplies for Hickman and Waterford. |                                   |               |                |                                      |

**Table 6-8 Wholesale: Water Supplies — Actual**

| Table 6-8 Wholesale: Water Supplies — Actual |                                   |               |                |                                      |
|--|-----------------------------------|---------------|----------------|--------------------------------------|
| Water Supply                                 | Additional Detail on Water Supply | 2015          |                |                                      |
|  |                                   | Actual Volume | Water Quality  | Total Right or Safe Yield (optional) |
| Surface water                                | Tuolumne River                    | 15,432        | Drinking Water |                                      |
| <b>Total</b>                                 |                                   | 15,432        |                | 0                                    |

NOTES: Volumes are in AF.

| Table 6-9 Retail: Water Supplies — Projected |              |  |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |  |
|--|--------------|--|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|--|
| Water Supply                                 |              | Projected Water Supply<br>Report To the Extent Practicable |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |  |
|  |              | 2020   |                                      | 2025                        |                                      | 2030                        |                                      | 2035                        |                                      | 2040 (opt)                  |                                      |  |
| Additional Detail on Water Supply            |              | Reasonably Available Volume                                | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |  |
| Purchased or Imported Water                  |              | 44,800   |                                      | 48,533                      |                                      | 52,267                      |                                      | 56,000                      |                                      | 59,733                      |                                      |  |
| Groundwater                                  |              | 24,666   | 53,500                               | 26,371                      | 53,500                               | 28,075                      | 53,500                               | 29,780                      | 53,500                               | 31,485                      | 53,500                               |  |
|  | <b>Total</b> | 69,466   | 53,500                               | 74,904                      | 53,500                               | 80,342                      | 53,500                               | 85,780                      | 53,500                               | 91,218                      | 53,500                               |  |

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).

| Water Supply  |  | Projected Water Supply<br><i>Report To the Extent Practicable</i> |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |        |   |
|---------------|--|---|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|--------|---|
|               |  | 2020  |                                      | 2025                        |                                      | 2030                        |                                      | 2035                        |                                      | 2040 (opt)                  |                                      |        |   |
|               |  | Reasonably Available Volume                                       | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |        |   |
| Surface water |  | 44,800  | 0                                    | 48,533                      | 0                                    | 52,267                      | 0                                    | 56,000                      | 0                                    | 59,733                      | 0                                    | 59,733 | 0 |
| <b>Total</b>  |  | 44,800  | 0                                    | 48,533                      | 0                                    | 52,267                      | 0                                    | 56,000                      | 0                                    | 59,733                      | 0                                    | 59,733 | 0 |

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).



**Table 7-1 Retail: Basis of Water Year Data**

| Year Type                                   | Base Year<br><i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i> | Available Supplies if Year Type Repeats |   |
|---|---|---|---|
|   |   | <input type="checkbox"/>                | Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.<br>Location _____ |
|   |   | <input checked="" type="checkbox"/>     | Quantification of available supplies is provided in this table as either volume only, percent only, or both.                    |
|   |   | Volume Available                        | % of Average Supply   |
| Average Year                                | 1984  | 87,100                                  | 100%  |
| Single-Dry Year                             | 2015  | 66,300                                  | 76%   |
| Multiple-Dry Years 1st Year                 | 2011  | 82,900                                  | 95%   |
| Multiple-Dry Years 2nd Year                 | 2012  | 78,800                                  | 90%   |
| Multiple-Dry Years 3rd Year                 | 2013  | 74,600                                  | 86%   |
| Multiple-Dry Years 4th Year <i>Optional</i> | 2014  | 70,500                                  | 81%   |
| Multiple-Dry Years 5th Year <i>Optional</i> | 2015  | 66,300                                  | 76%   |

NOTES: Volumes are in AF; totals rounded to nearest hundred. Includes both purchased water from MID and groundwater supplies. Volume of MID supply for the fifth multiple dry year based on the supply reduction that actually occurred in 2015. 2011 through 2014 MID supply volumes are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015). Assumes groundwater supply will not be reduced in dry years. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID.

**Table 7-1 Wholesale: Basis of Water Year Data**

| Year Type                                   | Base Year<br><i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i> | Available Supplies if Year Type Repeats |   |
|---|---|---|---|
|   |   | <input type="checkbox"/>                | Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.<br>Location _____ |
|   |   | <input checked="" type="checkbox"/>     | Quantification of available supplies is provided in this table as either volume only, percent only, or both.                    |
|   |   | Volume Available                        | % of Average Supply   |
| Average Year                                | 1984  | 33,600                                  | 100%  |
| Single-Dry Year                             | 2015  | 12,800                                  | 38%   |
| Multiple-Dry Years 1st Year                 | 2011  | 29,400                                  | 88%   |
| Multiple-Dry Years 2nd Year                 | 2012  | 25,300                                  | 75%   |
| Multiple-Dry Years 3rd Year                 | 2013  | 21,100                                  | 63%   |
| Multiple-Dry Years 4th Year <i>Optional</i> | 2014  | 17,000                                  | 50%   |
| Multiple-Dry Years 5th Year <i>Optional</i> | 2015  | 12,800                                  | 38%   |

NOTES: Volumes are in AF; totals rounded to nearest hundred. Volume for the fifth multiple dry year based on the supply reduction that actually occurred in 2015. 2011 through 2014 volumes are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID.

| Table 7-2 Retail: Normal Year Supply and Demand Comparison |        |        |        |        |                      |
|--|--------|--------|--------|--------|----------------------|
|  | 2020   | 2025   | 2030   | 2035   | 2040<br><i>(Opt)</i> |
| Supply totals  | 69,466 | 74,904 | 80,342 | 85,780 | 91,218               |
| Demand totals  | 69,466 | 74,904 | 80,342 | 85,780 | 91,218               |
| Difference   | 0      | 0      | 0      | 0      | 0                    |
| NOTES: Volumes are in AF.                                  |        |        |        |        |                      |

| Table 7-2 Wholesale: Normal Year Supply and Demand Comparison |        |        |        |        |                      |
|---|--------|--------|--------|--------|----------------------|
|   | 2020   | 2025   | 2030   | 2035   | 2040<br><i>(Opt)</i> |
| Supply totals   | 44,800 | 48,533 | 52,267 | 56,000 | 59,733               |
| Demand totals   | 44,800 | 48,533 | 52,267 | 56,000 | 59,733               |
| Difference  | 0      | 0      | 0      | 0      | 0                    |
| NOTES: Volumes are in AF.                                     |        |        |        |        |                      |

| <b>Table 7-3 Retail: Single Dry Year Supply and Demand Comparison</b>   |        |        |        |        |               |
|---|--------|--------|--------|--------|---------------|
|   | 2020   | 2025   | 2030   | 2035   | 2040<br>(Opt) |
| Supply totals   | 69,466 | 71,991 | 73,414 | 74,836 | 76,258        |
| Demand totals   | 69,466 | 71,991 | 73,414 | 74,836 | 76,258        |
| Difference  | 0      | 0      | 0      | 0      | 0             |
| <p>NOTES: Volumes are in AF. For planning purposes, a conservative supply condition assuming a 61.9 percent reduction in MID treated water supply during a single dry year is used here. Available groundwater supply assumed to be 53,500 AFA. The following demand reductions were required to match available supplies during a single dry year condition:</p> <ul style="list-style-type: none"> <li>2020 - 0%</li> <li>2025 - 4%</li> <li>2030 - 9%</li> <li>2035 - 13%</li> <li>2040 - 16%</li> </ul> |        |        |        |        |               |

| <b>Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison</b>   |        |        |        |        |            |
|--|--------|--------|--------|--------|------------|
|  | 2020   | 2025   | 2030   | 2035   | 2040 (Opt) |
| Supply totals  | 17,069 | 18,491 | 19,914 | 21,336 | 22,758     |
| Demand totals  | 17,069 | 18,491 | 19,914 | 21,336 | 22,758     |
| Difference   | 0      | 0      | 0      | 0      | 0          |
| <p>NOTES: Volumes are in AF. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming a 61.9 percent reduction in treated water supply during a single dry year is used here.</p> |        |        |        |        |            |

| Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison |               |        |        |        |        |            |
|---|---------------|--------|--------|--------|--------|------------|
|   |               | 2020   | 2025   | 2030   | 2035   | 2040 (Opt) |
| First year  | Supply totals | 69,466 | 74,904 | 80,342 | 85,780 | 91,218     |
|   | Demand totals | 69,466 | 74,904 | 80,342 | 85,780 | 91,218     |
|   | Difference    | 0      | 0      | 0      | 0      | 0          |
| Second year   | Supply totals | 70,553 | 75,991 | 81,429 | 86,867 | 92,305     |
|   | Demand totals | 70,553 | 75,991 | 81,429 | 86,867 | 92,305     |
|   | Difference    | 0      | 0      | 0      | 0      | 0          |
| Third year  | Supply totals | 71,641 | 77,079 | 82,517 | 87,955 | 92,012     |
|   | Demand totals | 71,641 | 77,079 | 82,517 | 87,955 | 92,012     |
|   | Difference    | 0      | 0      | 0      | 0      | 0          |
| Fourth year<br><i>(optional)</i>                                  | Supply totals | 72,728 | 78,167 | 81,026 | 82,911 | 84,796     |
|   | Demand totals | 72,728 | 78,167 | 81,026 | 82,911 | 84,796     |
|   | Difference    | 0      | 0      | 0      | 0      | 0          |
| Fifth year<br><i>(optional)</i>                                   | Supply totals | 71,707 | 73,129 | 74,551 | 75,974 | 77,396     |
|   | Demand totals | 71,707 | 73,129 | 74,551 | 75,974 | 77,396     |
|   | Difference    | 0      | 0      | 0      | 0      | 0          |

NOTES: Volumes are in AF. Projected demand based on the City of Modesto Water Master Plan. For planning purposes, a conservative supply condition assuming a 12.4, 24.8, 37.1, 49.5, and 61.9 percent reduction in MID treated water supply during consecutive dry years is used here. Available groundwater supply assumed to be 53,500 AFA. Demand reductions between 1 to 20 percent were required to match available supplies during the third, fourth, and fifth years.

| Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison |               |        |        |        |        |            |
|--|---------------|--------|--------|--------|--------|------------|
|  |               | 2020   | 2025   | 2030   | 2035   | 2040 (Opt) |
| First year   | Supply totals | 39,245 | 42,515 | 45,786 | 49,056 | 52,326     |
|  | Demand totals | 39,245 | 42,515 | 45,786 | 49,056 | 52,326     |
|  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Second year  | Supply totals | 34,251 | 37,059 | 39,866 | 42,674 | 45,481     |
|  | Demand totals | 34,251 | 37,059 | 39,866 | 42,674 | 45,481     |
|  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Third year   | Supply totals | 29,118 | 31,467 | 33,815 | 36,163 | 38,512     |
|  | Demand totals | 29,118 | 31,467 | 33,815 | 36,163 | 38,512     |
|  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Fourth year<br><i>(optional)</i>                                     | Supply totals | 23,755 | 25,640 | 27,526 | 29,411 | 31,296     |
|  | Demand totals | 23,755 | 25,640 | 27,526 | 29,411 | 31,296     |
|  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Fifth year<br><i>(optional)</i>                                      | Supply totals | 18,207 | 19,629 | 21,051 | 22,474 | 23,896     |
|  | Demand totals | 18,207 | 19,629 | 21,051 | 22,474 | 23,896     |
|  | Difference    | 0      | 0      | 0      | 0      | 0          |

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming multiple dry year reductions is used here (Year 1 = 12.4%, Year 2 = 24.8%, Year 3 = 37.1%, Year 4 = 49.5%, and Year 5 = 61.9%).



| Table 8-1 Retail Stages of Water Shortage Contingency Plan  |                                       |                             |
|---|---------------------------------------|-----------------------------|
| Stage   | Percent Supply Reduction <sup>1</sup> | Water Supply Condition      |
| I   | 10-20%                                | Minor Shortage Potential    |
| II  | 20-35%                                | Moderate Shortage Potential |
| IIA   | 30-40%                                | Medium Shortage Potential   |
| III   | 35-50%                                | Critical Shortage Potential |
| <sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%. |                                       |                             |
| NOTES: Based on the City's December 1, 2015 Drought Contingency Plan.                               |                                       |                             |

**Table 8-1 Wholesale Stages of Water Shortage Contingency Plan**

| Stage | Supply Reduction <sup>1</sup> | Water Supply Condition |
|-------|-------------------------------|------------------------|
| N/A   | N/A                           | N/A                    |

<sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.

NOTES: MID does not have a Water Shortage Contingency Plan.

**Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses**

| Stage | Restrictions and Prohibitions on End Users  | Additional Explanation or Reference<br><i>(optional)</i>  | Penalty, Charge, or Other Enforcement? |
|-------|---|---|--|
| I     | Landscape - Limit landscape irrigation to specific times                                    | Prohibit outdoor water use from noon - 7 PM, however, may be extended to 9 AM - 7 PM at Council discretion                | Yes                                    |
| II    | Landscape - Limit landscape irrigation to specific times                                    | Prohibit outdoor water use from 9 AM - 7 PM   | Yes                                    |
| I     | Landscape - Limit landscape irrigation to specific days                                     | Limit to no more than 3 days per week; odd-numbered addresses water W, F, Su and even-numbered addresses water Tu, Th, Sa | Yes                                    |
| II    | Landscape - Limit landscape irrigation to specific days                                     | Limit to no more than 2 days per week; odd-numbered addresses water W & Su and even-numbered addresses water Tu & Sa      | Yes                                    |
| IIA   | Landscape - Limit landscape irrigation to specific days                                     | Limit to no more than 1 day per week; odd-numbered addresses water Su and even-numbered addresses water Sa                | Yes                                    |
| III   | Landscape - Prohibit certain types of landscape irrigation                                  | No outdoor water use except for trees or shrubs by hand and vegetation maintained through drip irrigation                 | Yes                                    |
| III   | Landscape - Prohibit all landscape irrigation   | Moratorium on all new landscaping   | Yes                                    |
| I     | Landscape - Other landscape restriction or prohibition                                      | New landscaping must comply with existing and future landscape ordinances   | Yes                                    |
| II    | Landscape - Other landscape restriction or prohibition                                      | No irrigating turf or ornamental landscapes during or and 48 hours following measurable rainfall                          | Yes                                    |
| II    | CII - Lodging establishment must offer opt out of linen service                             |   | Yes                                    |
| I     | CII - Restaurants may only serve water upon request   | Encouraged only   | No                                     |
| II    | CII - Restaurants may only serve water upon request   |   | Yes                                    |
| III   | CII - Other CII restriction or prohibition  | Moratorium on all new connections   | Yes                                    |
| II    | Water Features - Restrict water use for decorative water features, such as fountains        | No use of outdoor fountains except for maintenance purposes   | Yes                                    |
| III   | Other water feature or swimming pool restriction  | Moratorium on all new swimming pools  | Yes                                    |
| I     | Other - Customers must repair leaks, breaks, and malfunctions in a timely manner            | Water leaks, once identified by home owner, must be repaired within 24 hours  | Yes                                    |
| I     | Other - Require automatic shut of hoses   |   | Yes                                    |
| I     | Other - Prohibit use of potable water for washing hard surfaces                             | Hosing concrete areas, building exteriors, etc., is prohibited except for health and safety concerns                      | Yes                                    |
| III   | Other - Prohibit vehicle washing except at facilities using recycled or recirculating water | Permitted at car wash facilities only   | Yes                                    |
| I     | Other   | Car washing limited to specific times and days (same as irrigation use)   | Yes                                    |
| I     | Other   | Require water meter installation on all new single family homes   | Yes                                    |
| II    | Other   | Mandatory retrofit of low flow showerheads in homes when building/remodeling occurs                                       | Yes                                    |
| III   | Other   | Mandatory retrofit of low flow toilets in homes when building/remodeling occurs   | Yes                                    |

NOTES: Based on the City's December 1, 2015 Drought Contingency Plan.

**Table 8-3 Retail Only:  
Stages of Water Shortage Contingency Plan - Consumption Reduction Methods**

| Stage | Consumption Reduction Methods by Water Supplier           | Additional Explanation or Reference<br><i>(optional)</i> |
|-------|---|--|
| All   | Expand Public Information Campaign                        |  |
| All   | Improve Customer Billing                                  | Residential metering program                             |
| All   | Offer Water Use Surveys                                   | Residential water surveys and landscape water surveys    |
| All   | Provide Rebates on Plumbing Fixtures and Devices          |  |
| All   | Provide Rebates for Landscape Irrigation Efficiency       |  |
| All   | Decrease Line Flushing                                    |  |
| All   | Increase Water Waste Patrols                              |  |
| I     | Reduce System Water Loss                                  | Repair water leaks                                       |
| III   | Moratorium or Net Zero Demand Increase on New Connections | Moratorium on all new landscaping and connections        |
| All   | Other   |  |

NOTES: Consumption reduction methods associated with an "All" stage are on-going DMMS (see Chapter 9 for additional discussion).

| <b>Table 8-4 Retail: Minimum Supply Next Three Years</b>  |        |        |        |
|---|--------|--------|--------|
|   | 2016   | 2017   | 2018   |
| Available Water Supply  | 82,300 | 70,500 | 66,300 |
| <p>NOTES: Volumes are in AF; totals rounded to nearest hundred. For planning purposes, a conservative supply condition was used and assumes that the MRWTP Phase Two Expansion may not be available. 2016 based on current conditions (14.3 percent reduction in MID supply). 2017 and 2018 are estimated based on the driest multiple year historic sequence for the City's water supply (Years 4 and 5: assumes 49.5 percent and 61.9 percent reductions in MID supply, respectively). Available groundwater supply assumed to be 53,500 AFA.</p> |        |        |        |

**Table 8-4 Wholesale: Minimum Supply Next Three Years**

|                        | 2016   | 2017   | 2018   |
|------------------------|--------|--------|--------|
| Available Water Supply | 28,800 | 17,000 | 12,800 |

NOTES: Volumes are in AF; totals rounded to nearest hundred. The projected supply from the MRWTP Phase Two Expansion has not been determined so only the currently available supply was assumed (33,600 AFA) to be available in the next three years for conservative planning purposes. For 2016, assumes a 14.3 percent surface water supply reduction (36-inches available) based on current conditions. For 2017 and 2018, assumes Years 4 and 5 surface water reductions during a multiple year drought (49.5 percent and 61.9 percent reductions, respectively). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming multiple dry year reductions is used here.

| Table 10-1 Retail: Notification to Cities and Counties |                                     |                                     |
|--|-------------------------------------|-------------------------------------|
| City Name  | 60 Day Notice                       | Notice of Public Hearing            |
| City of Turlock  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| City of Ceres  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| City of Modesto  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| County Name  | 60 Day Notice                       | Notice of Public Hearing            |
| Stanislaus County                                      | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|  | <input type="checkbox"/>            | <input type="checkbox"/>            |
|  |                                     |                                     |

**Table 10-1 Wholesale: Notification to Cities and Counties (select one)**

| <input type="checkbox"/>            | Supplier has notified more than 10 cities or counties in accordance with CWC 10621 (b) and 10642.<br><b>Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.</b> |                                     |
|-------------------------------------|---|-------------------------------------|
|                                     | Provide the page or location of this list in the UWMP.  |                                     |
| <input checked="" type="checkbox"/> | Supplier has notified 10 or fewer cities or counties.<br><b>Complete the table below.</b>   |                                     |
| City Name                           | 60 Day Notice   | Notice of Public Hearing            |
| City of Turlock                     | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/> |
| City of Ceres                       | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/> |
| City of Modesto                     | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/> |
| County Name                         | 60 Day Notice   | Notice of Public Hearing            |
| Stanislaus County                   | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/> |
| NOTES:                              |   |                                     |



## **APPENDIX C**

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### DWR 2015 Urban Water Management Plan Checklist

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**Appendix C. Urban Water Management Plan Checklist  
Checklist Arranged by Subject**

| CWC Section           | UWMP Requirement  | Subject                                      | Guidebook Location    | UWMP Location                                     |
|-----------------------|---|--|-----------------------|---|
| <b>10620(b)</b>       | Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.   | Plan Preparation                             | Section 2.1           | Section 2.1 (page 2-1)                            |
| <b>10620(d)(2)</b>    | Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.                                   | Plan Preparation                             | Section 2.5.2         | Section 2.5.2 (page 2-4)                          |
| <b>10642</b>          | Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.                              | Plan Preparation                             | Section 2.5.2         | Section 2.5.2.2 (page 2-4); Appendix D            |
| <b>10631(a)</b>       | Describe the water supplier service area.   | System Description                           | Section 3.1           | Section 3.2 (page 3-1)                            |
| <b>10631(a)</b>       | Describe the climate of the service area of the supplier.   | System Description                           | Section 3.3           | Section 3.3 (page 3-4)                            |
| <b>10631(a)</b>       | Provide population projections for 2020, 2025, 2030, and 2035.  | System Description                           | Section 3.4           | Sections 3.4.1 and 3.4.2 (page 3-5)               |
| <b>10631(a)</b>       | Describe other demographic factors affecting the supplier's water management planning.  | System Description                           | Section 3.4           | Section 3.4.3 (page 3-6)                          |
| <b>10631(a)</b>       | Indicate the current population of the service area.  | System Description and Baselines and Targets | Sections 3.4 and 5.4  | Sections 3.4.1 and 3.4.2 (page 3-5)               |
| <b>10631(e)(1)</b>    | Quantify past, current, and projected water use, identifying the uses among water use sectors.  | System Water Use                             | Section 4.2           | Section 4.2 (page 4-2)                            |
| <b>10631(e)(3)(A)</b> | Report the distribution system water loss for the most recent 12-month period available.  | System Water Use                             | Section 4.3           | Section 4.3 (page 4-6)                            |
| <b>10631.1(a)</b>     | Include projected water use needed for lower income housing projected in the service area of the supplier.  | System Water Use                             | Section 4.5           | Section 4.5 (page 4-7)                            |
| <b>10608.20(b)</b>    | Retail suppliers shall adopt a 2020 water use target using one of four methods.   | Baselines and Targets                        | Section 5.7 and App E | Section 5.6 (page 5-4); Appendix F                |
| <b>10608.20(e)</b>    | Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data. | Baselines and Targets                        | Chapter 5 and App E   | Sections 5.5, 5.6, and 5.7 (page 5-4); Appendix F |
| <b>10608.22</b>       | Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply to the suppliers base GPCD is at or below 100.  | Baselines and Targets                        | Section 5.7.2         | Section 5.6 (page 5-5); Appendix F                |
| <b>10608.24(a)</b>    | Retail suppliers shall meet their interim target by December 31, 2015.  | Baselines and Targets                        | Section 5.8 and App E | Section 5.7 (page 5-5); Appendix F                |
| <b>1608.24(d)(2)</b>  | If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.   | Baselines and Targets                        | Section 5.8.2         | Section 5.7 (page 5-6)                            |
| <b>10608.36</b>       | Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.   | Baselines and Targets                        | Section 5.1           | Section 9.3 (page 9-13)                           |
| <b>10608.40</b>       | Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.   | Baselines and Targets                        | Section 5.8 and App E | Section 5.7 (page 5-5); Appendix F                |
| <b>10631(b)</b>       | Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.   | System Supplies                              | Chapter 6             | Section 6.10 (page 6-25)                          |
| <b>10631(b)</b>       | Indicate whether groundwater is an existing or planned source of water available to the supplier.   | System Supplies                              | Section 6.2           | Section 6.4 (page 6-4)                            |
| <b>10631(b)(1)</b>    | Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.  | System Supplies                              | Section 6.2.2         | Section 6.4.1.3 (page 6-8); Appendix H            |
| <b>10631(b)(2)</b>    | Describe the groundwater basin.   | System Supplies                              | Section 6.2.1         | Section 6.4.1.1 (page 6-5)                        |
| <b>10631(b)(2)</b>    | Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.   | System Supplies                              | Section 6.2.2         | Section 6.4.1.3 (page 6-8)                        |
| <b>10631(b)(2)</b>    | For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.  | System Supplies                              | Section 6.2.3         | Section 6.4.1.5 (page 6-11)                       |

**Appendix C. Urban Water Management Plan Checklist  
Checklist Arranged by Subject**

| CWC Section                     | UWMP Requirement   | Subject                             | Guidebook Location      | UWMP Location   |
|---------------------------------|--|-------------------------------------|-------------------------|---|
| <b>10631(b)(3)</b>              | Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years.  | System Supplies                     | Section 6.2.4           | Section 6.4.1.6 (page 6-11);<br>Section 6.4.2 (page 6-12) |
| <b>10631(b)(4)</b>              | Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.  | System Supplies                     | Sections 6.2 and 6.9    | Section 6.10 (page 6-25);                                 |
| <b>10631(d)</b>                 | Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.   | System Supplies                     | Section 6.7             | Section 6.8 (page 6-21)                                   |
| <b>10631(g)</b>                 | Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.   | System Supplies                     | Section 6.8             | Section 6.9 (page 6-22)                                   |
| <b>10631(i)</b>                 | Describe desalinated water project opportunities for long-term supply.   | System Supplies                     | Section 6.6             | Section 6.7 (page 6-21)                                   |
| <b>10631(j)</b>                 | Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.  | System Supplies                     | Section 2.5.1           | Section 2.5.1 (page 2-3)                                  |
| <b>10631(j)</b>                 | Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types. | System Supplies                     | Section 2.5.1           | Section 2.5.1 (page 2-3)                                  |
| <b>10633</b>                    | For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.  | System Supplies (Recycled Water)    | Section 6.5.1           | Section 6.6.1 (page 6-13)                                 |
| <b>10633(a)</b>                 | Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.  | System Supplies (Recycled Water)    | Section 6.5.2           | Section 6.6.2 (page 6-14)                                 |
| <b>10633(b)</b>                 | Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.  | System Supplies (Recycled Water)    | Section 6.5.2.2         | Section 6.6.2 (page 6-14)                                 |
| <b>10633(c)</b>                 | Describe the recycled water currently being used in the supplier's service area.   | System Supplies (Recycled Water)    | Section 6.5.3 and 6.5.4 | Section 6.6.3 (page 6-17)                                 |
| <b>10633(d)</b>                 | Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.  | System Supplies (Recycled Water)    | Section 6.5.4           | Section 6.6.4 (page 6-17)                                 |
| <b>10633(e)</b>                 | Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.   | System Supplies (Recycled Water)    | Section 6.5.4           | Section 6.6.4 (page 6-17)                                 |
| <b>10633(f)</b>                 | Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.   | System Supplies (Recycled Water)    | Section 6.5.5           | Section 6.6.5 (page 6-20)                                 |
| <b>10633(g)</b>                 | Provide a plan for optimizing the use of recycled water in the supplier's service area.  | System Supplies (Recycled Water)    | Section 6.5.5           | Section 6.6.5 (page 6-20)                                 |
| <b>10620(f)</b>                 | Describe water management tools and options to maximize resources and minimize the need to import water from other regions.  | Water Supply Reliability Assessment | Section 7.4             | Section 7.4 (page 7-14)                                   |
| <b>10631(c)(1)</b>              | Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.   | Water Supply Reliability Assessment | Section 7.1             | Section 7.1 (page 7-1)                                    |
| <b>10631(c)(1)</b>              | Provide data for an average water year, a single dry water year, and multiple dry water years  | Water Supply Reliability Assessment | Section 7.2             | Section 7.2 (page 7-2)                                    |
| <b>10631(c)(2)</b>              | For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.  | Water Supply Reliability Assessment | Section 7.1             | Section 7.1 (page 7-1);<br>Section 7.4 (page 7-14)        |
| <b>10634</b>                    | Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability   | Water Supply Reliability Assessment | Section 7.1             | Section 7.1 (page 7-1);<br>Section 7.4 (page 7-14)        |
| <b>10635(a)</b>                 | Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.  | Water Supply Reliability Assessment | Section 7.3             | Section 7.3 (page 7-7)                                    |
| <b>10632(a) and 10632(a)(1)</b> | Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.   | Water Shortage Contingency Planning | Section 8.1             | Section 8.1 (page 8-1)                                    |
| <b>10632(a)(2)</b>              | Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.   | Water Shortage Contingency Planning | Section 8.9             | Section 8.9 (page 8-8)                                    |
| <b>10632(a)(3)</b>              | Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.  | Water Shortage Contingency Planning | Section 8.8             | Section 8.8 (page 8-8)                                    |

**Appendix C. Urban Water Management Plan Checklist  
Checklist Arranged by Subject**

| CWC Section        | UWMP Requirement   | Subject                                      | Guidebook Location              | UWMP Location                        |
|--------------------|--|--|---------------------------------|--------------------------------------|
| <b>10632(a)(4)</b> | Identify mandatory prohibitions against specific water use practices during water shortages.   | Water Shortage Contingency Planning          | Section 8.2                     | Section 8.2 (page 8-2)               |
| <b>10632(a)(5)</b> | Specify consumption reduction methods in the most restrictive stages.  | Water Shortage Contingency Planning          | Section 8.4                     | Section 8.4 (page 8-4)               |
| <b>10632(a)(6)</b> | Indicated penalties or charges for excessive use, where applicable.  | Water Shortage Contingency Planning          | Section 8.3                     | Section 8.3 (page 8-4)               |
| <b>10632(a)(7)</b> | Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.                           | Water Shortage Contingency Planning          | Section 8.6                     | Section 8.6 (page 8-6)               |
| <b>10632(a)(8)</b> | Provide a draft water shortage contingency resolution or ordinance.  | Water Shortage Contingency Planning          | Section 8.7                     | Section 8.7 (page 8-7); Appendix I   |
| <b>10632(a)(9)</b> | Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.   | Water Shortage Contingency Planning          | Section 8.5                     | Section 8.5 (page 8-5)               |
| <b>10631(f)(1)</b> | Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.   | Demand Management Measures                   | Sections 9.2 and 9.3            | Sections 9.1 and 9.2 (page 9-2)      |
| <b>10631(f)(2)</b> | Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.  | Demand Management Measures                   | Sections 9.1 and 9.3            | Section 9.3 (page 9-13)              |
| <b>10631(j)</b>    | CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU. | Demand Management Measures                   | Section 9.5                     | Section 9.5 (page 9-15)              |
| <b>10608.26(a)</b> | Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.   | Plan Adoption, Submittal, and Implementation | Section 10.3                    | Section 10.3 (page 10-2)             |
| <b>10621(b)</b>    | Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.                                | Plan Adoption, Submittal, and Implementation | Section 10.2.1                  | Section 10.2 (page 10-1); Appendix D |
| <b>10621(d)</b>    | Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.   | Plan Adoption, Submittal, and Implementation | Sections 10.3.1 and 10.4        | Section 10.4 (page 10-3)             |
| <b>10635(b)</b>    | Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.                                    | Plan Adoption, Submittal, and Implementation | Section 10.4.4                  | Section 10.4 (page 10-3)             |
| <b>10642</b>       | Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan.  | Plan Adoption, Submittal, and Implementation | Sections 10.2.2, 10.3, and 10.5 | Section 10.3 (page 10-2); Appendix D |
| <b>10642</b>       | The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.   | Plan Adoption, Submittal, and Implementation | Sections 10.2.1                 | Section 10.2 (page 10-1); Appendix D |
| <b>10642</b>       | Provide supporting documentation that the plan has been adopted as prepared or modified.   | Plan Adoption, Submittal, and Implementation | Section 10.3.1                  | Section 10.3 (page 10-2); Appendix K |
| <b>10644(a)</b>    | Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.  | Plan Adoption, Submittal, and Implementation | Section 10.4.3                  | Section 10.4 (page 10-3)             |
| <b>10644(a)(1)</b> | Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.  | Plan Adoption, Submittal, and Implementation | Section 10.4.4                  | Section 10.4 (page 10-3)             |
| <b>10644(a)(2)</b> | The plan, or amendments to the plan, submitted to the department shall be submitted electronically.  | Plan Adoption, Submittal, and Implementation | Sections 10.4.1 and 10.4.2      | Section 10.4 and 10.7 (page 10-3)    |
| <b>10645</b>       | Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.  | Plan Adoption, Submittal, and Implementation | Section 10.5                    | Section 10.5 (page 10-3)             |

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## **APPENDIX D**

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### Required Notices

- Joint UWMP Contact List
- Joint UWMP Notice

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**City of Modesto/MID Joint Urban Water Management Plan Contact List**

|                                     |                    |  |                                     |                                |   |
|-------------------------------------|--------------------|--|-------------------------------------|--------------------------------|---|
| City of Turlock                     | Garner Reyonlds    | Regulatory Affairs Manager                       | 209-668-5599 x4407<br>Cell 541-7575 | greynolds@turlock.ca.us        | 156 S Broadway, Ste 270, Turlock, CA 95380                            |
| Stanislaus County                   | Matt Machado       | Stanislaus County Public Works Director          | 209-525-6550                        | machadom@stancounty.com        | 1716 Morgan Rd, Modesto CA 95358                                      |
| Modesto Irrigation District         | Patrick Ryan       | Civil Engineering Manager                        | 209-526-7564                        | patrick.ryan@mid.org           | 1231 Eleventh St. Modesto, CA 95354 or PO Box 4060, Modesto, CA 95352 |
| Turlock Irrigation District (prime) | Debbie Liebersbach | Water Planning Department Manager                | 209-883-8428                        | dcliebersbach@ttd.org          | 333 East Canal Dr. PO Box 949, Turlock, CA 95381-0949                 |
| City of Ceres                       | Mike Brinton       | Public Works Director                            | 209-538-5748                        | Michael.Brinton@ci.ceres.ca.us | 2220 Hackett, Ceres, CA 95307   |
| City of Waterford                   | Matt Erickson      | Public Works Director (primary contact)          | 209-874-2328                        | merickson@cityofwaterford.org  | 312 E Street, Waterford, CA 95386                                     |
| City of Riverbank                   | Michael Riddell    | Deputy Development Services Director -Operations | 209-869-7128                        | mriddell@riverbank.org         | 2901 High Street, Riverbank, CA 95367                                 |
| City of Oakdale                     | Thom Clark         | Public Services Director                         | 209-845-3615                        | tclark@oakdale.ca.us           | 455 South Fifth Ave, Oakdale, CA 95361                                |
| Oakdale Irrigation District         | Steve Knell        | General Manager                                  | 209-847-0341 x207                   | stknell@oakdaleirrigation.com  | 1205 East F Street, Oakdale, CA 95361                                 |
| City of Patterson                   | Mike Willett       | Public Works Director                            | 209-895-8065                        | MWillett@ci.patterson.ca.us    | 1 Plaza Circle, Patterson, CA 95363                                   |
| City of Newman                      | Kim Koosun         | Public Works Director                            | 209-862-4448                        | kkim@cityofnewman.com          | Fresno Street P.O. Box 787 Newman, CA 95360                           |



## NOTICE

### **CITY OF MODESTO AND MODESTO IRRIGATION DISTRICT 2015 JOINT URBAN WATER MANAGEMENT PLAN UPDATE**

DATE: February 5, 2016  
TO: All Interested Parties  
FROM: Jim Alves, Associate Civil Engineer  
SUBJECT: 2015 Joint Urban Water Management Plan Update

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Water purveyors within the State of California are required to review and update their Urban Water Management Plans every five years. The City of Modesto and the Modesto Irrigation District are conducting a joint effort for the 2015 Urban Water Management Plan by submitting a single plan document for both water purveyors. As part of this process, the City of Modesto and the Modesto Irrigation District are required to notify Stanislaus County and agencies within the County of this planned update at least 60 days prior to the proposed public hearing (California Water Code §10621(b)).

By State law, the City of Modesto and the Modesto Irrigation District must adopt and submit the final plan to the California Department of Water Resources by July 1, 2016 (California Water Code §10621(d))

If you have any questions or comments regarding the update of the City of Modesto and Modesto Irrigation District 2015 Joint Urban Water Management Plan, please contact either:

Mr. Jim Alves  
Associate Civil Engineer  
City of Modesto  
P.O. Box 462  
Modesto, CA 95353  
(209) 571-5557  
jalves@modestogov.com

Mr. Patrick Ryan  
Water Treatment Plant Manager  
Modesto Irrigation District  
P.O. Box 4060  
Modesto, CA 95352  
(209) 526-7656  
patrickr@mid.org

Sincerely,

Mr. Jim Alves  
City of Modesto

Mr. Patrick Ryan  
Modesto Irrigation District

## **APPENDIX E**

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Water Audit

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# AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

## Please begin by providing the following information

Name of Contact Person:

Email Address:

Telephone (incl Ext.):

Name of City / Utility:

City/Town/Municipality:

State / Province:

Country:

Year:

Start Date:  Enter MM/YYYY numeric format

End Date:  Enter MM/YYYY numeric format

Audit Preparation Date:

Volume Reporting Units:

PWSID / Other ID:

## The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons:  Pcnt:  Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

### Instructions

The current sheet. Enter contact information and basic audit details (year, units etc)

### Reporting Worksheet

Enter the required data on this worksheet to calculate the water balance and data grading

### Comments

Enter comments to explain how values were calculated or to document data sources

### Performance Indicators

Review the performance indicators to evaluate the results of the audit

### Water Balance

The values entered in the Reporting Worksheet are used to populate the Water Balance

### Dashboard

A graphical summary of the water balance and Non-Revenue Water components

### Grading Matrix

Presents the possible grading options for each input component of the audit

### Service Connection Diagram

Diagrams depicting possible customer service connection line configurations

### Definitions

Use this sheet to understand the terms used in the audit process

### Loss Control Planning

Use this sheet to interpret the results of the audit validity score and performance indicators

### Example Audits

Reporting Worksheet and Performance Indicators examples are shown for two validated audits

### Acknowledgements

Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: [wlc@awwa.org](mailto:wlc@awwa.org)



# AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

## Please begin by providing the following information

Name of Contact Person:

Email Address:

Telephone (incl Ext.):

Name of City / Utility:

City/Town/Municipality:

State / Province:

Country:

Year:

Start Date:  Enter MM/YYYY numeric format

End Date:  Enter MM/YYYY numeric format

Audit Preparation Date:

Volume Reporting Units:

PWSID / Other ID:

## The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons:  Pcnt:  Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

|   |   |   |  |   |   |
|---|---|---|--|---|---|
| <p><b><u>Instructions</u></b></p> <p>The current sheet. Enter contact information and basic audit details (year, units etc)</p> | <p><b><u>Reporting Worksheet</u></b></p> <p>Enter the required data on this worksheet to calculate the water balance and data grading</p> | <p><b><u>Comments</u></b></p> <p>Enter comments to explain how values were calculated or to document data sources</p> | <p><b><u>Performance Indicators</u></b></p> <p>Review the performance indicators to evaluate the results of the audit</p>                        | <p><b><u>Water Balance</u></b></p> <p>The values entered in the Reporting Worksheet are used to populate the Water Balance</p>        | <p><b><u>Dashboard</u></b></p> <p>A graphical summary of the water balance and Non-Revenue Water components</p> |
| <p><b><u>Grading Matrix</u></b></p> <p>Presents the possible grading options for each input component of the audit</p>          | <p><b><u>Service Connection Diagram</u></b></p> <p>Diagrams depicting possible customer service connection line configurations</p>        | <p><b><u>Definitions</u></b></p> <p>Use this sheet to understand the terms used in the audit process</p>              | <p><b><u>Loss Control Planning</u></b></p> <p>Use this sheet to interpret the results of the audit validity score and performance indicators</p> | <p><b><u>Example Audits</u></b></p> <p>Reporting Worksheet and Performance Indicators examples are shown for two validated audits</p> | <p><b><u>Acknowledgements</u></b></p> <p>Acknowledgements for the AWWA Free Water Audit Software v5.0</p>       |

If you have questions or comments regarding the software please contact us via email at: [wlc@awwa.org](mailto:wlc@awwa.org)



# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0  
American Water Works Association.  
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? Click to access definition  
+ Click to add a comment

Water Audit Report for: **Modesto Irrigation District**  
Reporting Year: **2015** | **1/2015 - 12/2015**

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

### Master Meter and Supply Error Adjustments

#### WATER SUPPLIED

<----- Enter grading in column 'E' and 'J' ----->

|                          |     |    |            |            |
|--------------------------|-----|----|------------|------------|
| Volume from own sources: | + ? | 10 | 15,291.000 | acre-ft/yr |
| Water imported:          | + ? | 10 | 0.000      | acre-ft/yr |
| Water exported:          | + ? | 10 | 0.000      | acre-ft/yr |

|       |        |            |
|-------|--------|------------|
| Pcnt: | Value: | acre-ft/yr |
| + ?   | 0.000  | acre-ft/yr |
| + ?   |        | acre-ft/yr |
| + ?   |        | acre-ft/yr |

Enter negative % or value for under-registration  
Enter positive % or value for over-registration

**WATER SUPPLIED:** **15,291.000** acre-ft/yr

#### AUTHORIZED CONSUMPTION

|                     |     |    |            |            |
|---------------------|-----|----|------------|------------|
| Billed metered:     | + ? | 10 | 15,260.000 | acre-ft/yr |
| Billed unmetered:   | + ? | 10 | 0.000      | acre-ft/yr |
| Unbilled metered:   | + ? | 10 | 0.000      | acre-ft/yr |
| Unbilled unmetered: | + ? | 10 | 0.000      | acre-ft/yr |

Click here: ?  
for help using option buttons below

|       |        |            |
|-------|--------|------------|
| Pcnt: | Value: | acre-ft/yr |
|       | 0.000  | acre-ft/yr |

Use buttons to select percentage of water supplied OR value

**AUTHORIZED CONSUMPTION:** **15,260.000** acre-ft/yr

#### WATER LOSSES (Water Supplied - Authorized Consumption)

**31.000** acre-ft/yr

#### Apparent Losses

|                                  |     |   |       |            |
|----------------------------------|-----|---|-------|------------|
| Unauthorized consumption:        | + ? | 8 | 0.020 | acre-ft/yr |
| Customer metering inaccuracies:  | + ? | 8 | 0.000 | acre-ft/yr |
| Systematic data handling errors: | + ? | 9 | 0.010 | acre-ft/yr |

|       |        |            |
|-------|--------|------------|
| Pcnt: | Value: | acre-ft/yr |
|       | 0.020  | acre-ft/yr |

|  |       |            |
|--|-------|------------|
|  |       | acre-ft/yr |
|  | 0.010 | acre-ft/yr |

**Apparent Losses:** **0.030** acre-ft/yr

#### Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **30.970** acre-ft/yr

**WATER LOSSES:** **31.000** acre-ft/yr

#### NON-REVENUE WATER

**NON-REVENUE WATER:** **31.000** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

#### SYSTEM DATA

|   |     |    |      |                 |
|---|-----|----|------|-----------------|
| Length of mains:  | + ? | 10 | 31.0 | miles           |
| Number of <u>active AND inactive</u> service connections: | + ? | 10 | 41   |                 |
| Service connection density:                               | ?   |    | 1    | conn./mile main |

Are customer meters typically located at the curbstop or property line? **No** (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line: + ? 10  ft

Average operating pressure: + ? 5 **60.0** psi

#### COST DATA

|   |     |    |              |   |
|---|-----|----|--------------|---|
| Total annual cost of operating water system:            | + ? | 10 | \$10,908,507 | \$/Year   |
| Customer retail unit cost (applied to Apparent Losses): | + ? | 10 | \$2.19       | \$/1000 gallons (US)  |
| Variable production cost (applied to Real Losses):      | + ? | 7  |              | \$/acre-ft <input checked="" type="checkbox"/> Use Customer Retail Unit Cost to value real losses |

#### WATER AUDIT DATA VALIDITY SCORE:

\*\*\* YOUR SCORE IS: 93 out of 100 \*\*\*

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

#### PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Variable production cost (applied to Real Losses)
- 2: Customer metering inaccuracies
- 3: Unauthorized consumption



## **APPENDIX F**

---

SB X7-7 Compliance and Verification Forms

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**SB X7-7 Table 0: Units of Measure Used in UWMP\***

*(select one from the drop down list)*

Acre Feet

*\*The unit of measure must be consistent with Table 2-3*

NOTES:

**SB X7-7 Table-1: Baseline Period Ranges**

| Baseline                          | Parameter  | Value  | Units     |
|-----------------------------------|--|--------|-----------|
| 10- to 15-year<br>baseline period | 2008 total water deliveries                          | 75,030 | Acre Feet |
|                                   | 2008 total volume of delivered recycled water        | 0      | Acre Feet |
|                                   | 2008 recycled water as a percent of total deliveries | 0.00%  | Percent   |
|                                   | Number of years in baseline period <sup>1, 2</sup>   | 10     | Years     |
|                                   | Year beginning baseline period range                 | 1999   |           |
|                                   | Year ending baseline period range <sup>3</sup>       | 2008   |           |
| 5-year<br>baseline period         | Number of years in baseline period                   | 5      | Years     |
|                                   | Year beginning baseline period range                 | 2003   |           |
|                                   | Year ending baseline period range <sup>4</sup>       | 2007   |           |

<sup>1</sup> If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. <sup>2</sup> The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.

<sup>3</sup> The ending year must be between December 31, 2004 and December 31, 2010.

<sup>4</sup> The ending year must be between December 31, 2007 and December 31, 2010.

NOTES: Water production from Hickman and Waterford are not included.

**SB X7-7 Table 2: Method for Population Estimates**

| <b>Method Used to Determine Population</b><br>(may check more than one)  |  |
|--|--|
| <input checked="" type="checkbox"/>  | <b>1. Department of Finance (DOF)</b><br>DOF Table E-4 and 2010 Census Benchmark |
| <input checked="" type="checkbox"/>  | <b>2. Persons-per-Connection Method</b>  |
| <input type="checkbox"/>   | <b>3. DWR Population Tool</b>  |
| <input type="checkbox"/>   | <b>4. Other</b><br>DWR recommends pre-review                                     |
| NOTES: Where DOF data are not available (e.g., Turlock and Ceres (Walnut Manor)), the population has been estimated based on a count of existing dwelling units served by the City (from aerial photographs) and an estimated housing density (people per dwelling unit) (based on Census data for the surrounding communities). |  |

**SB X7-7 Table 3: Service Area Population**

| <b>Year</b>  | <b>Population</b> |         |
|--|-------------------|---------|
| <b>10 to 15 Year Baseline Population</b>                       |                   |         |
| Year 1   | 1999              | 224,237 |
| Year 2   | 2000              | 228,723 |
| Year 3   | 2001              | 234,915 |
| Year 4   | 2002              | 241,035 |
| Year 5   | 2003              | 245,809 |
| Year 6   | 2004              | 249,188 |
| Year 7   | 2005              | 249,692 |
| Year 8   | 2006              | 249,918 |
| Year 9   | 2007              | 250,877 |
| Year 10  | 2008              | 251,639 |
| <i>Year 11</i>   |                   |         |
| <i>Year 12</i>   |                   |         |
| <i>Year 13</i>   |                   |         |
| <i>Year 14</i>   |                   |         |
| <i>Year 15</i>   |                   |         |
| <b>5 Year Baseline Population</b>                              |                   |         |
| Year 1   | 2003              | 245,809 |
| Year 2   | 2004              | 249,188 |
| Year 3   | 2005              | 249,692 |
| Year 4   | 2006              | 249,918 |
| Year 5   | 2007              | 250,877 |
| <b>2015 Compliance Year Population</b>                         |                   |         |
| <b>2015</b>  |                   | 259,187 |
| NOTES: Population from Hickman and Waterford are not included. |                   |         |

**SB X7-7 Table 4: Annual Gross Water Use \***

| Baseline Year<br><i>Fm SB X7-7 Table 3</i>           | Volume Into Distribution System<br><i>This column will remain blank until SB X7-7 Table 4-A is completed.</i> | Deductions     |                                      |   |                                      |   | Annual Gross Water Use |
|--|---|----------------|--------------------------------------|---|--------------------------------------|---|------------------------|
|  |   | Exported Water | Change in Dist. System Storage (+/-) | Indirect Recycled Water<br><i>This column will remain blank until SB X7-7 Table 4-B is completed.</i> | Water Delivered for Agricultural Use | Process Water<br><i>This column will remain blank until SB X7-7 Table 4-D is completed.</i> |                        |
| <b>10 to 15 Year Baseline - Gross Water Use</b>      |   |                |                                      |   |                                      |   |                        |
| Year 1   | 1999  | 77,685         |                                      |   | -                                    |   | 77,685                 |
| Year 2   | 2000  | 74,194         |                                      |   | -                                    |   | 74,194                 |
| Year 3   | 2001  | 78,278         |                                      |   | -                                    |   | 78,278                 |
| Year 4   | 2002  | 80,378         |                                      |   | -                                    |   | 80,378                 |
| Year 5   | 2003  | 80,168         |                                      |   | -                                    |   | 80,168                 |
| Year 6   | 2004  | 78,801         |                                      |   | -                                    |   | 78,801                 |
| Year 7   | 2005  | 76,517         |                                      |   | -                                    |   | 76,517                 |
| Year 8   | 2006  | 76,275         |                                      |   | -                                    |   | 76,275                 |
| Year 9   | 2007  | 77,020         |                                      |   | -                                    |   | 77,020                 |
| Year 10  | 2008  | 75,030         |                                      |   | -                                    |   | 75,030                 |
| <i>Year 11</i>                                       | 0   | -              |                                      |   | -                                    |   | -                      |
| <i>Year 12</i>                                       | 0   | -              |                                      |   | -                                    |   | -                      |
| <i>Year 13</i>                                       | 0   | -              |                                      |   | -                                    |   | -                      |
| <i>Year 14</i>                                       | 0   | -              |                                      |   | -                                    |   | -                      |
| <i>Year 15</i>                                       | 0   | -              |                                      |   | -                                    |   | -                      |
| <b>10 - 15 year baseline average gross water use</b> |   |                |                                      |   |                                      |   | <b>77,434</b>          |
| <b>5 Year Baseline - Gross Water Use</b>             |   |                |                                      |   |                                      |   |                        |
| Year 1   | 2003  | 80,168         |                                      |   | -                                    |   | 80,168                 |
| Year 2   | 2004  | 78,801         |                                      |   | -                                    |   | 78,801                 |
| Year 3   | 2005  | 76,517         |                                      |   | -                                    |   | 76,517                 |
| Year 4   | 2006  | 76,275         |                                      |   | -                                    |   | 76,275                 |
| Year 5   | 2007  | 77,020         |                                      |   | -                                    |   | 77,020                 |
| <b>5 year baseline average gross water use</b>       |   |                |                                      |   |                                      |   | <b>77,756</b>          |
| <b>2015 Compliance Year - Gross Water Use</b>        |   |                |                                      |   |                                      |   |                        |
| <b>2015</b>  |   | 47,459         | -                                    |   | -                                    |   | <b>47,459</b>          |

\* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES: Volumes are in AF. Water production from Hickman and Waterford are not included. Potable water use only.

| <b>SB X7-7 Table 4-A: Volume Entering the Distribution</b>  |                                 |                                     |  |   |
|---|---------------------------------|-------------------------------------|--|---|
| <b>Name of Source</b>   |                                 | Groundwater                         |  |   |
| <b>This water source is:</b>  |                                 |                                     |  |   |
| <input checked="" type="checkbox"/>   | The supplier's own water source |                                     |  |   |
| <input type="checkbox"/>  | A purchased or imported source  |                                     |  |   |
| <b>Baseline Year</b><br><i>Fm SB X7-7 Table 3</i>   |                                 | Volume Entering Distribution System | Meter Error Adjustment*<br><i>Optional (+/-)</i> | Corrected Volume Entering Distribution System |
| <b>10 to 15 Year Baseline - Water into Distribution System</b>                                    |                                 |                                     |  |   |
| Year 1  | 1999                            | 42,388                              |  | 42,388  |
| Year 2  | 2000                            | 40,482                              |  | 40,482  |
| Year 3  | 2001                            | 43,350                              |  | 43,350  |
| Year 4  | 2002                            | 46,454                              |  | 46,454  |
| Year 5  | 2003                            | 44,839                              |  | 44,839  |
| Year 6  | 2004                            | 43,711                              |  | 43,711  |
| Year 7  | 2005                            | 44,010                              |  | 44,010  |
| Year 8  | 2006                            | 42,769                              |  | 42,769  |
| Year 9  | 2007                            | 40,449                              |  | 40,449  |
| Year 10   | 2008                            | 42,997                              |  | 42,997  |
| Year 11   | -                               |                                     |  | 0   |
| Year 12   | -                               |                                     |  | 0   |
| Year 13   | -                               |                                     |  | 0   |
| Year 14   | -                               |                                     |  | 0   |
| Year 15   | -                               |                                     |  | 0   |
| <b>5 Year Baseline - Water into Distribution System</b>   |                                 |                                     |  |   |
| Year 1  | 2003                            | 44,839                              |  | 44,839  |
| Year 2  | 2004                            | 43,711                              |  | 43,711  |
| Year 3  | 2005                            | 44,010                              |  | 44,010  |
| Year 4  | 2006                            | 42,769                              |  | 42,769  |
| Year 5  | 2007                            | 40,449                              |  | 40,449  |
| <b>2015 Compliance Year - Water into Distribution System</b>                                      |                                 |                                     |  |   |
|   | <b>2015</b>                     | 32,058                              |  | 32,058  |
| <i>* Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document</i> |                                 |                                     |  |   |
| NOTES: Volumes are in AF. Water production from Hickman and Waterford are not included.           |                                 |                                     |  |   |



**SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction** (For use only by agencies that are deducting indirect recycled water)

| Baseline Year<br><i>Fm SB X7-7 Table 3</i>   | Surface Reservoir Augmentation  |                              |   |                                 |   | Groundwater Recharge                       |                                      |  | Total Deductible<br>Volume of Indirect<br>Recycled Water<br>Entering the<br>Distribution System |
|--|---|------------------------------|---|---------------------------------|---|--|--------------------------------------|--|---|
|  | Volume<br>Discharged<br>from<br>Reservoir for<br>Distribution<br>System<br>Delivery | Percent<br>Recycled<br>Water | Recycled<br>Water<br>Delivered to<br>Treatment<br>Plant | Transmission/<br>Treatment Loss | Recycled<br>Volume<br>Entering<br>Distribution<br>System from<br>Surface<br>Reservoir<br>Augmentation | Recycled<br>Water<br>Pumped by<br>Utility* | Transmission/<br>Treatment<br>Losses | Recycled<br>Volume<br>Entering<br>Distribution<br>System from<br>Groundwater<br>Recharge |   |
| <b>10-15 Year Baseline - Indirect Recycled Water Use</b>   |   |                              |   |                                 |   |  |                                      |  |   |
| Year 1   | 1999  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 2   | 2000  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 3   | 2001  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 4   | 2002  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 5   | 2003  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 6   | 2004  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 7   | 2005  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 8   | 2006  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 9   | 2007  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 10  | 2008  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 11  | 0   |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 12  | 0   |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 13  | 0   |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 14  | 0   |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 15  | 0   |                              |   | -                               | -   |  |                                      | -  | -   |
| <b>5 Year Baseline - Indirect Recycled Water Use</b>   |   |                              |   |                                 |   |  |                                      |  |   |
| Year 1   | 2003  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 2   | 2004  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 3   | 2005  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 4   | 2006  |                              |   | -                               | -   |  |                                      | -  | -   |
| Year 5   | 2007  |                              |   | -                               | -   |  |                                      | -  | -   |
| <b>2015 Compliance - Indirect Recycled Water Use</b>   |   |                              |   |                                 |   |  |                                      |  |   |
|  | <b>2015</b>   |                              |   | -                               | -   |  |                                      | -  | -   |
| *Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c. |   |                              |   |                                 |   |  |                                      |  |   |
| NOTES:   |   |                              |   |                                 |   |  |                                      |  |   |

**SB X7-7 Table 4-C: Process Water Deduction Eligibility**

*(For use only by agencies that are deducting process water) Choose Only One*

|                          |  |
|--------------------------|--|
| <input type="checkbox"/> | <b>Criteria 1</b> - Industrial water use is equal to or greater than 12% of gross water use.<br>Complete SB X7-7 Table 4-C.1 |
| <input type="checkbox"/> | <b>Criteria 2</b> - Industrial water use is equal to or greater than 15 GPCD.<br>Complete SB X7-7 Table 4-C.2                |
| <input type="checkbox"/> | <b>Criteria 3</b> - Non-industrial use is equal to or less than 120 GPCD.<br>Complete SB X7-7 Table 4-C.3                    |
| <input type="checkbox"/> | <b>Criteria 4</b> - Disadvantaged Community.<br>Complete SB x7-7 Table 4-C.4   |

NOTES:

**SB X7-7 Table 4-C.1: Process Water Deduction Eligibility**

**Criteria 1**

Industrial water use is equal to or greater than 12% of gross water use

| <b>Baseline Year</b><br><i>Fm SB X7-7 Table 3</i>                   | Gross Water Use Without Process Water Deduction | Industrial Water Use | Percent Industrial Water | Eligible for Exclusion Y/N |
|---|---|----------------------|--------------------------|----------------------------|
| <b>10 to 15 Year Baseline - Process Water Deduction Eligibility</b> |   |                      |                          |                            |
| Year 1  | 1999  | 77,685               | 0%                       | NO                         |
| Year 2  | 2000  | 74,194               | 0%                       | NO                         |
| Year 3  | 2001  | 78,278               | 0%                       | NO                         |
| Year 4  | 2002  | 80,378               | 0%                       | NO                         |
| Year 5  | 2003  | 80,168               | 0%                       | NO                         |
| Year 6  | 2004  | 78,801               | 0%                       | NO                         |
| Year 7  | 2005  | 76,517               | 0%                       | NO                         |
| Year 8  | 2006  | 76,275               | 0%                       | NO                         |
| Year 9  | 2007  | 77,020               | 0%                       | NO                         |
| Year 10   | 2008  | 75,030               | 0%                       | NO                         |
| Year 11   | 0   | -                    |                          | NO                         |
| Year 12   | 0   | -                    |                          | NO                         |
| Year 13   | 0   | -                    |                          | NO                         |
| Year 14   | 0   | -                    |                          | NO                         |
| Year 15   | 0   | -                    |                          | NO                         |
| <b>5 Year Baseline - Process Water Deduction Eligibility</b>        |   |                      |                          |                            |
| Year 1  | 2003  | 80,168               | 0%                       | NO                         |
| Year 2  | 2004  | 78,801               | 0%                       | NO                         |
| Year 3  | 2005  | 76,517               | 0%                       | NO                         |
| Year 4  | 2006  | 76,275               | 0%                       | NO                         |
| Year 5  | 2007  | 77,020               | 0%                       | NO                         |
| <b>2015 Compliance Year - Process Water Deduction Eligibility</b>   |   |                      |                          |                            |
| <b>2015</b>   | 47,459  |                      | 0%                       | NO                         |

NOTES:

**SB X7-7 Table 4-C.2: Process Water Deduction Eligibility**

**Criteria 2**

Industrial water use is equal to or greater than 15 GPCD

| Baseline Year<br><i>Fm SB X7-7 Table 3</i>                          | Industrial Water Use | Population | Industrial GPCD | Eligible for Exclusion Y/N |
|---|----------------------|------------|-----------------|----------------------------|
| <b>10 to 15 Year Baseline - Process Water Deduction Eligibility</b> |                      |            |                 |                            |
| Year 1  | 1999                 |            | 224,237         | - NO                       |
| Year 2  | 2000                 |            | 228,723         | - NO                       |
| Year 3  | 2001                 |            | 234,915         | - NO                       |
| Year 4  | 2002                 |            | 241,035         | - NO                       |
| Year 5  | 2003                 |            | 245,809         | - NO                       |
| Year 6  | 2004                 |            | 249,188         | - NO                       |
| Year 7  | 2005                 |            | 249,692         | - NO                       |
| Year 8  | 2006                 |            | 249,918         | - NO                       |
| Year 9  | 2007                 |            | 250,877         | - NO                       |
| Year 10   | 2008                 |            | 251,639         | - NO                       |
| <i>Year 11</i>  | 0                    |            | -               | NO                         |
| <i>Year 12</i>  | 0                    |            | -               | NO                         |
| <i>Year 13</i>  | 0                    |            | -               | NO                         |
| <i>Year 14</i>  | 0                    |            | -               | NO                         |
| <i>Year 15</i>  | 0                    |            | -               | NO                         |
| <b>5 Year Baseline - Process Water Deduction Eligibility</b>        |                      |            |                 |                            |
| Year 1  | 2003                 |            | 245,809         | - NO                       |
| Year 2  | 2004                 |            | 249,188         | - NO                       |
| Year 3  | 2005                 |            | 249,692         | - NO                       |
| Year 4  | 2006                 |            | 249,918         | - NO                       |
| Year 5  | 2007                 |            | 250,877         | - NO                       |
| <b>2015 Compliance Year - Process Water Deduction Eligibility</b>   |                      |            |                 |                            |
| <b>2015</b>   |                      |            | 259,187         | - NO                       |

NOTES:

**SB X7-7 Table 4-C.3: Process Water Deduction Eligibility**

**Criteria 3**

Non-industrial use is equal to or less than 120 GPCD

| Baseline Year<br><i>Fm SB X7-7 Table 3</i>                          |      | Gross Water Use Without Process Water Deduction<br><i>Fm SB X7-7 Table 4</i> | Industrial Water Use | Non-industrial Water Use | Population<br><i>Fm SB X7-7 Table 3</i> | Non-Industrial GPCD | Eligible for Exclusion<br>Y/N |
|---|------|--|----------------------|--------------------------|---|---------------------|-------------------------------|
| <b>10 to 15 Year Baseline - Process Water Deduction Eligibility</b> |      |  |                      |                          |   |                     |                               |
| Year 1  | 1999 | 77,685   |                      | 77,685                   | 224,237                                 | 309                 | NO                            |
| Year 2  | 2000 | 74,194   |                      | 74,194                   | 228,723                                 | 290                 | NO                            |
| Year 3  | 2001 | 78,278   |                      | 78,278                   | 234,915                                 | 297                 | NO                            |
| Year 4  | 2002 | 80,378   |                      | 80,378                   | 241,035                                 | 298                 | NO                            |
| Year 5  | 2003 | 80,168   |                      | 80,168                   | 245,809                                 | 291                 | NO                            |
| Year 6  | 2004 | 78,801   |                      | 78,801                   | 249,188                                 | 282                 | NO                            |
| Year 7  | 2005 | 76,517   |                      | 76,517                   | 249,692                                 | 274                 | NO                            |
| Year 8  | 2006 | 76,275   |                      | 76,275                   | 249,918                                 | 272                 | NO                            |
| Year 9  | 2007 | 77,020   |                      | 77,020                   | 250,877                                 | 274                 | NO                            |
| Year 10   | 2008 | 75,030   |                      | 75,030                   | 251,639                                 | 266                 | NO                            |
| <i>Year 11</i>  | 0    | -  |                      | -                        | -                                       |                     | NO                            |
| <i>Year 12</i>  | 0    | -  |                      | -                        | -                                       |                     | NO                            |
| <i>Year 13</i>  | 0    | -  |                      | -                        | -                                       |                     | NO                            |
| <i>Year 14</i>  | 0    | -  |                      | -                        | -                                       |                     | NO                            |
| <i>Year 15</i>  | 0    | -  |                      | -                        | -                                       |                     | NO                            |
| <b>5 Year Baseline - Process Water Deduction Eligibility</b>        |      |  |                      |                          |   |                     |                               |
| Year 1  | 2003 | 80,168   |                      | 80,168                   | 245,809                                 | 291                 | NO                            |
| Year 2  | 2004 | 78,801   |                      | 78,801                   | 249,188                                 | 282                 | NO                            |
| Year 3  | 2005 | 76,517   |                      | 76,517                   | 249,692                                 | 274                 | NO                            |
| Year 4  | 2006 | 76,275   |                      | 76,275                   | 249,918                                 | 272                 | NO                            |
| Year 5  | 2007 | 77,020   |                      | 77,020                   | 250,877                                 | 274                 | NO                            |
| <b>2015 Compliance Year - Process Water Deduction Eligibility</b>   |      |  |                      |                          |   |                     |                               |
| <b>2015</b>   |      | 47,459   |                      | 47,459                   | 259,187                                 | 163                 | NO                            |

NOTES:

### SB X7-7 Table 4-C.4: Process Water Deduction Eligibility

#### Criteria 4

Disadvantaged Community

Use *IRWM DAC Mapping tool* [http://www.water.ca.gov/irwm/grants/resources\\_dac.cfm](http://www.water.ca.gov/irwm/grants/resources_dac.cfm)

| California Median Household Income                         | Service Area Median Household Income | Percentage of Statewide Average | Eligible for Exclusion? Y/N |
|--|--------------------------------------|---------------------------------|-----------------------------|
| 2015 Compliance Year - Process Water Deduction Eligibility |                                      |                                 |                             |
| 2010   | \$53,046                             |                                 | 0% YES                      |

A "Disadvantaged Community" is a community with a median household income less than 80 percent of the statewide average.

NOTES:

**SB X7-7 Table 4-D: Process Water Deduction - Volume**

*Complete a*

*separate table for each industrial customer with a process water exclusion*

| Name of Industrial Customer                             |                                       | Industrial Customer 1                 |                                     |                                    |  |  |
|---|---------------------------------------|---------------------------------------|-------------------------------------|------------------------------------|--|--|
| Baseline Year<br><i>Fm SB X7-7 Table 3</i>              | Industrial Customer's Total Water Use | Total Volume Supplied by Water Agency | % of Water Supplied by Water Agency | Customer's Total Process Water Use | Volume of Process Water Eligible for Exclusion for this Customer |  |
| <b>10 to 15 Year Baseline - Process Water Deduction</b> |                                       |                                       |                                     |                                    |  |  |
| Year 1  | 1999                                  |                                       |                                     |                                    | -  |  |
| Year 2  | 2000                                  |                                       |                                     |                                    | -  |  |
| Year 3  | 2001                                  |                                       |                                     |                                    | -  |  |
| Year 4  | 2002                                  |                                       |                                     |                                    | -  |  |
| Year 5  | 2003                                  |                                       |                                     |                                    | -  |  |
| Year 6  | 2004                                  |                                       |                                     |                                    | -  |  |
| Year 7  | 2005                                  |                                       |                                     |                                    | -  |  |
| Year 8  | 2006                                  |                                       |                                     |                                    | -  |  |
| Year 9  | 2007                                  |                                       |                                     |                                    | -  |  |
| Year 10   | 2008                                  |                                       |                                     |                                    | -  |  |
| <i>Year 11</i>  | 0                                     |                                       |                                     |                                    | -  |  |
| <i>Year 12</i>  | 0                                     |                                       |                                     |                                    | -  |  |
| <i>Year 13</i>  | 0                                     |                                       |                                     |                                    | -  |  |
| <i>Year 14</i>  | 0                                     |                                       |                                     |                                    | -  |  |
| <i>Year 15</i>  | 0                                     |                                       |                                     |                                    | -  |  |
| <b>5 Year Baseline - Process Water Deduction</b>        |                                       |                                       |                                     |                                    |  |  |
| Year 1  | 2003                                  |                                       |                                     |                                    | -  |  |
| Year 2  | 2004                                  |                                       |                                     |                                    | -  |  |
| Year 3  | 2005                                  |                                       |                                     |                                    | -  |  |
| Year 4  | 2006                                  |                                       |                                     |                                    | -  |  |
| Year 5  | 2007                                  |                                       |                                     |                                    | -  |  |
| <b>2015 Compliance Year - Process Water Deduction</b>   |                                       |                                       |                                     |                                    |  |  |
|   | <b>2015</b>                           |                                       |                                     |                                    | -  |  |
| NOTES:  |                                       |                                       |                                     |                                    |  |  |

**SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)**

| <b>Baseline Year</b><br><i>Fm SB X7-7 Table 3</i>  |      | <b>Service Area Population</b><br><i>Fm SB X7-7 Table 3</i> | <b>Annual Gross Water Use</b><br><i>Fm SB X7-7 Table 4</i> | <b>Daily Per Capita Water Use (GPCD)</b> |
|--|------|---|--|--|
| <b>10 to 15 Year Baseline GPCD</b>   |      |   |  |  |
| Year 1   | 1999 | 224,237   | 77,685   | 309                                      |
| Year 2   | 2000 | 228,723   | 74,194   | 290                                      |
| Year 3   | 2001 | 234,915   | 78,278   | 297                                      |
| Year 4   | 2002 | 241,035   | 80,378   | 298                                      |
| Year 5   | 2003 | 245,809   | 80,168   | 291                                      |
| Year 6   | 2004 | 249,188   | 78,801   | 282                                      |
| Year 7   | 2005 | 249,692   | 76,517   | 274                                      |
| Year 8   | 2006 | 249,918   | 76,275   | 272                                      |
| Year 9   | 2007 | 250,877   | 77,020   | 274                                      |
| Year 10  | 2008 | 251,639   | 75,030   | 266                                      |
| <i>Year 11</i>   | 0    | -   | -  |  |
| <i>Year 12</i>   | 0    | -   | -  |  |
| <i>Year 13</i>   | 0    | -   | -  |  |
| <i>Year 14</i>   | 0    | -   | -  |  |
| <i>Year 15</i>   | 0    | -   | -  |  |
| <b>10-15 Year Average Baseline GPCD</b>  |      |   |  | <b>285</b>                               |
| <b>5 Year Baseline GPCD</b>  |      |   |  |  |
| <b>Baseline Year</b><br><i>Fm SB X7-7 Table 3</i>  |      | <b>Service Area Population</b><br><i>Fm SB X7-7 Table 3</i> | <b>Gross Water Use</b><br><i>Fm SB X7-7 Table 4</i>        | <b>Daily Per Capita Water Use</b>        |
| Year 1   | 2003 | 245,809   | 80,168   | 291                                      |
| Year 2   | 2004 | 249,188   | 78,801   | 282                                      |
| Year 3   | 2005 | 249,692   | 76,517   | 274                                      |
| Year 4   | 2006 | 249,918   | 76,275   | 272                                      |
| Year 5   | 2007 | 250,877   | 77,020   | 274                                      |
| <b>5 Year Average Baseline GPCD</b>  |      |   |  | <b>279</b>                               |
| <b>2015 Compliance Year GPCD</b>   |      |   |  |  |
| <b>2015</b>  |      | 259,187   | 47,459   | <b>163</b>                               |
| NOTES: Volumes are in AF. Population and water production from Hickman and Waterford are not included. Potable water use only. |      |   |  |  |



**SB X7-7 Table 6: Gallons per Capita per Day**  
*Summary From Table SB X7-7 Table 5*

|                           |     |
|---------------------------|-----|
| 10-15 Year Baseline GPCD  | 285 |
| 5 Year Baseline GPCD      | 279 |
| 2015 Compliance Year GPCD | 163 |
| NOTES:                    |     |

**SB X7-7 Table 7: 2020 Target Method***Select Only One*

| Target Method                       |          | Supporting Documentation   |
|-------------------------------------|----------|--|
| <input checked="" type="checkbox"/> | Method 1 | SB X7-7 Table 7A   |
| <input type="checkbox"/>            | Method 2 | SB X7-7 Tables 7B, 7C, and 7D<br><i>Contact DWR for these tables</i> |
| <input type="checkbox"/>            | Method 3 | SB X7-7 Table 7-E  |
| <input type="checkbox"/>            | Method 4 | Method 4 Calculator  |

NOTES:

**SB X7-7 Table 7-A: Target Method 1**

20% Reduction

| 10-15 Year Baseline<br>GPCD | 2020 Target<br>GPCD |
|-----------------------------|---------------------|
| 285                         | 228                 |
| NOTES:                      |                     |

**SB X7-7 Table 7-B: Target Method 2**

Target

Landscape Water Use

Tables for Target Method 2 (SB X7-7 Tables 7-B, 7-C, and 7-D) are not included in the SB X7-7 Verification Form, but are still required for water suppliers using Target Method 2. These water suppliers should contact Gwen Huff at (916) 651-9672 or [gwen.huff@water.ca.gov](mailto:gwen.huff@water.ca.gov)

**SB X7-7 Table 7-C: Target Method 2**

Target CII Water Use

Tables for Target Method 2 (SB X7-7 Tables 7-B, 7-C, and 7-D) are not included in the SB X7-7 Verification Form, but are still required for water suppliers using Target Method 2. These water suppliers should contact Gwen Huff at (916) 651-9672 or [gwen.huff@water.ca.gov](mailto:gwen.huff@water.ca.gov)

### **SB X7-7 Table 7-D: Target Method 2 Summary**

Tables for Target Method 2 (SB X7-7 Tables 7-B, 7-C, and 7-D) are not included in the SB X7-7 Verification Form, but are still required for water suppliers using Target Method 2. These water suppliers should contact Gwen Huff at (916) 651-9672 or [gwen.huff@water.ca.gov](mailto:gwen.huff@water.ca.gov)

**SB X7-7 Table 7-E: Target Method 3**

| Agency May Select More Than One as Applicable  | Percentage of Service Area in This Hydrological Region | Hydrologic Region | "2020 Plan" Regional Targets | Method 3 Regional Targets (95%) |
|--|--|-------------------|------------------------------|---------------------------------|
| <input type="checkbox"/>   |  | North Coast       | 137                          | 130                             |
| <input type="checkbox"/>   |  | North Lahontan    | 173                          | 164                             |
| <input type="checkbox"/>   |  | Sacramento River  | 176                          | 167                             |
| <input type="checkbox"/>   |  | San Francisco Bay | 131                          | 124                             |
| <input checked="" type="checkbox"/>  | 100%   | San Joaquin River | 174                          | 165                             |
| <input type="checkbox"/>   |  | Central Coast     | 123                          | 117                             |
| <input type="checkbox"/>   |  | Tulare Lake       | 188                          | 179                             |
| <input type="checkbox"/>   |  | South Lahontan    | 170                          | 162                             |
| <input type="checkbox"/>   |  | South Coast       | 149                          | 142                             |
| <input type="checkbox"/>   |  | Colorado River    | 211                          | 200                             |
| <b>Target</b><br><i>(If more than one region is selected, this value is calculated.)</i> |  |                   |                              | <b>165</b>                      |
| NOTES:   |  |                   |                              |                                 |

**SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target**

| 5 Year<br>Baseline GPCD<br><i>From SB X7-7<br/>Table 5</i> | Maximum 2020<br>Target <sup>1</sup> | Calculated<br>2020 Target <sup>2</sup> | <b>Confirmed<br/>2020 Target</b> |
|--|-------------------------------------|--|----------------------------------|
| 279  | 265                                 | 228                                    | <b>228</b>                       |

<sup>1</sup> Maximum 2020 Target is 95% of the 5 Year Baseline GPCD  
<sup>2</sup> 2020  
Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and  
corresponding tables for agency's calculated target.

NOTES:



**SB X7-7 Table 8: 2015 Interim Target GPCD**

| Confirmed<br>2020 Target<br><i>Fm SB X7-7<br/>Table 7-F</i> | 10-15 year<br>Baseline GPCD<br><i>Fm SB X7-7<br/>Table 5</i> | <b>2015 Interim<br/>Target GPCD</b> |
|---|--|-------------------------------------|
| 228   | 285  | <b>257</b>                          |

NOTES:

**SB X7-7 Table 9: 2015 Compliance**

| Actual 2015<br>GPCD | 2015 Interim<br>Target GPCD | Optional Adjustments <i>(in GPCD)</i> |                          |                        |                      |                       | 2015 GPCD<br><i>(Adjusted if<br/>applicable)</i> | Did Supplier<br>Achieve<br>Targeted<br>Reduction for<br>2015? |
|---------------------|-----------------------------|---------------------------------------|--------------------------|------------------------|----------------------|-----------------------|--|---|
|                     |                             | Enter "0" if Adjustment Not Used      |                          |                        | TOTAL<br>Adjustments | Adjusted 2015<br>GPCD |  |   |
|                     |                             | Extraordinary<br>Events               | Weather<br>Normalization | Economic<br>Adjustment |                      |                       |  |   |
| 163                 | 257                         | -                                     | -                        | -                      | -                    | 163                   | 163  | <b>YES</b>  |

NOTES:

## **APPENDIX G**

---

MID Supply Reliability Information

DRAFT

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Amended and Restated Treatment and Delivery Agreement

Between

Modesto Irrigation District and City of Modesto

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AMENDED AND RESTATED  
TREATMENT AND DELIVERY AGREEMENT

AMONG

MODESTO IRRIGATION DISTRICT AND CITY OF MODESTO

1. PARTIES.

The Parties to this Amended and Restated Treatment and Delivery Agreement are Modesto Irrigation District, a California irrigation district, and City of Modesto, a California municipal corporation and charter city, who agree as follows:

2. RECITALS.

This Agreement is made with reference to the following facts and circumstances, among others:

2.1. District Formation and General Purposes. District was formed more than 100 years ago for the purpose of providing irrigation water to serve the needs of agriculture. To that end, District has perfected water rights sufficient to meet those needs. District's development of its water rights and its agricultural irrigation delivery system, and the careful attention to the needs of District's agricultural water users, have been prominent in making Stanislaus County one of the world's foremost agricultural areas. In recent years, population growth within District's boundaries has reduced the irrigated acreage while increasing the demand for municipal uses of water. The Parties desire to put to beneficial municipal use for the inhabitants of District certain amounts of surface water to which District has rights. In doing so, the Parties shall be mindful of the great importance of District's water rights, and the significant role of agriculture within District. The area to be served with water pursuant to this Agreement is within District's Irrigation District Boundary. The water to be supplied by District pursuant to this Agreement is not surplus water, but rather is water which has historically been put to beneficial agricultural use within District and is now necessary for municipal use within District.

2.2. [Not Used]

2.3. Water Management Study. District and City authorized, received, and accepted the Study, which was completed in 1984.

2.4. Problems of Reliance on Groundwater. The Study found, in part, that existing groundwater sources of City are limited and supplies are declining, and that a continued decline in the quantity of groundwater will result in a gradual degradation of the quality of the groundwater. This degradation of quality, combined with on-going Modifications to State and Federal drinking water standards, will make it increasingly difficult to meet domestic water supply demands solely through the use of groundwater.

2.5. Water Rights. District has certain water rights with respect to the waters of the Tuolumne River.

2.6. Study Recommendation. The Water Management Study recommended, in part, that City and DEW contract with District for treated surface water to supplement its groundwater supplies. This resulted in construction of the existing surface water treatment plant located at the Modesto Reservoir. The design, financing, construction, operation and maintenance of the water treatment plant was implemented pursuant to the Treatment and Delivery Agreement Among Modesto Irrigation District, City of Modesto, and Del Este Water Company that was approved in 1992.

2.7. Projection Expansion. Pursuant to the 1992 Agreement, District designed and constructed, and now owns, operates and maintains, the initial Project facilities, including the Modesto Regional Water Treatment Plant, which has a rated treatment capacity of 30 million gallons of treated water per day (mgd). The 1992 Agreement contemplates that the parties may agree at some time to expand the Project up to a capacity of 60 mgd.

2.8. Environmental Clearance. District, with the assistance of its environmental consultant, completed a final environmental impact report for the Initial Facilities and, on April 17, 1990, the Board of Directors of District adopted Resolution 90-50 which, among other things, certified the EIR and caused a Notice of Determination to proceed with the Project to be filed in accordance with the California Environmental Quality Act and the CEQA Guidelines. The parties prepared a Subsequent Environmental Impact Report on the First Expansion Facilities, and District and City cooperated as CEQA co-lead agencies of the preparation of the SEIR, which addresses the First Expansion Facilities and this Amended and Restated Agreement. The SEIR also studies other City water system improvements to be financed, designed,

constructed and operated by City outside of this Agreement. The parties have certified the SEIR and made appropriate CEQA findings. (See District Resolution No. 2005-92, pertaining to SEIR Certification; District Resolution No. 2005-158, pertaining to CEQA Findings; City Resolution No. 2005-378, pertaining to the SEIR Certification; City Resolution No. 2005-515, pertaining to the CEQA Findings.)

2.9 Use of Available Water to Carry Out Recommendations of the Urban Water Management Plan. It is in the best interests of the Parties and their respective water users to utilize District's available water to expand the present capacity of the MRWTP to provide treated water to City in an environmentally acceptable manner, which is not injurious to agricultural water users or any other interests of District.

2.10. Enterprise Fund. It is the intention of the Parties that, except as specifically provided otherwise herein, the Project shall be financially operated as an enterprise fund with costs borne by City, and with neither profits nor losses accruing to District as a result of the Project. All terms of this Agreement shall be construed in accordance with the intent of this Section 2.10.

2.11. Long Term Water Supply. By this Agreement, the Parties intend to provide for and increase the long-term source of domestic Treated Water supply for City.

2.12. Conservation. In entering into this Agreement, the Parties recognize that it is important to continue to encourage both urban and agricultural water users within District to utilize water conservation practices, which are effective, practical, and economical.

2.13. Groundwater. The Parties recognize the importance of an adequate supply of good quality groundwater. The Parties in the future, as they deem appropriate, shall cooperate in necessary ground water management efforts as may be required by future State or Federal legislation or regulations.

2.14. DEW Acquisition. In 1995, City acquired certain assets of DEW, including all of the Company's rights, interests and obligations in and to the Project and 1992 Agreement. The parties acknowledge and confirm that (a) District has consented to this transfer and assignment pursuant to the 1992 Agreement, (b) DEW is no longer a party to the 1992 Agreement, and (c) all DEW's rights, interests and obligations in and to the 1992 Agreement have been transferred to and accepted by City. Consequently, DEW no longer has any right or interest in the 1992 Agreement or the Project and therefore is not a party to this Agreement.

2.15. Purpose of Agreement. The Parties desire to amend the 1992 Agreement to (a) provide for expansion of the MRWTP to 60 mgd and construction of related facilities, (b) address City's acquisition of DEW's interests in the 1992 Agreement and Project, and (c) make certain other changes. In order to simplify and clarify the applicable contract terms and consolidate all current contract terms and conditions into a single document, the parties have incorporated the amendments into this amended and restated agreement, which includes the 1992 Agreement as amended.

3. AMENDMENT AND RESTATEMENT OF 1992 AGREEMENT.

The 1992 Agreement is hereby amended and restated in full with the amendments as set forth in this Amended and Restated Treatment and Delivery Agreement. The 1992 Agreement therefore is hereby terminated and superseded by this Agreement. Any right, debt, obligation or liability under or secured by the 1992 Agreement shall be deemed a right, debt, obligation or liability under or secured by this Agreement.

4. DEFINITIONS.

4.1. Advances. All costs advanced by District pursuant to Section 10.1 during the Design Phase, except Sunk Costs, together with an estimate made just prior to the Financing and agreed upon by the Parties with respect to all advances, which are to be made by District prior to the end of the Design Phase.

4.2. Advisory Committees. The committees created pursuant to Section 18.6.

4.3. Agreement. This Amended and Restated Treatment and Delivery Agreement between District and City.

4.4. 1992 Agreement. The Treatment and Delivery Agreement Among Modesto Irrigation District, City of Modesto, and Del Este Water District that was approved in 1992.

4.5. Approvals. The licenses, permits, entitlements, and privileges necessary for the construction, operation, and maintenance of the Project.

4.6. Board. The Board of Directors of District.

4.7. Chief Executive Officers. The City Manager and the General Manager of District, or their respective designees.

4.8. City. City of Modesto.

4.9. City Gross Water Revenues. All gross income and revenue received or receivable by City from the ownership and operation of City Municipal Water System, which gross income

and revenue shall be calculated in accordance with generally accepted accounting principles, including all rates, fees, and charges received by City for water service and connection and hook-up fees and all other income and revenue however derived by City from the ownership and operation of or arising from City Municipal Water System, but excluding in all cases any proceeds of taxes and any refundable deposits made to establish credit, federal or state grants, or advances or contributions in aid of construction, or monetary recoveries in lawsuits on behalf of City's water rate payers for environmental and other torts and actions at law.

4.10. City Municipal Water System. The municipal water system of City existing on the effective date of this Agreement and all additions, betterments, extensions, and improvements thereto hereafter acquired or constructed.

4.11. Commercial Operation Date. The first day following the Test Period.

4.12. Commercial Operation Phase. The (a) ongoing operation and maintenance of the Initial Facilities, and (b) for the First Expansion Facilities, the Period beginning with the Commercial Operation Date and continuing thereafter.

4.13. Construction Phase. The Period during which the First Expansion Facilities are constructed, ending with the end of the Test Period.

4.14. Debt Service. The payments required to be made for principal, interest, and other charges, if any, to the holders of evidences of indebtedness or certificates of participation issued by District pursuant to this Agreement to finance the Project. If bond insurance is used in connection with Fixed Financing, Debt Service shall include bond insurance premiums.

4.15. Debt Service Reserve Fund. The fund established and maintained pursuant to Section 12.2 of this Agreement.

4.16. Design Phase. The Period of First Expansion Facilities environmental review and design ending with the start of construction of the Project.

4.17. DEW. Del Este Water Company.

4.18. District. Modesto Irrigation District.

4.19. District Interest Rate. For the Period for which interest is to be calculated, interest at the same average monthly yield as District earns on its general fund portfolio, provided, however, that if at any time District's average cost of borrowing money exceeds District's rate of return on its general fund portfolio, the interest on amounts advanced by District shall be District's cost of borrowed money. In no event shall the rate of interest determined pursuant to

this Section 4.18 as applied exceed the legal limit. Interest shall accrue monthly beginning at the time District actually expends the funds on which the interest is to accrue.

4.20. District's Electrical Service Area Boundary. The boundary of the electrical service area of District as shown on the official maps and records of District.

4.21. District's Irrigation District Boundary. The irrigation district boundary of District, as opposed to District's Electrical Service Area Boundary, as shown on the official maps and records of District.

4.22. Domestic Water Year. Each 12 month period commencing on May 1 and ending on the next succeeding April 30.

4.23. Finance Committee. A committee consisting of the Director of Finance of City and the chief financial officer of District, or their respective designees.

4.24. Financing. The actual putting into place of Variable Financing or Fixed Financing to the point of the disbursement of funds as needed to allow construction of the First Expansion Facilities to proceed.

4.25. First Expansion Facilities. The expansion of the MRWTP as described in the SEIR (but excluding those water system transmission and storage facilities to be financed, designed and constructed by City), or such other First Expansion Facilities description as may be approved by the parties in writing.

4.26. Fixed Costs. All costs other than Debt Service which must be borne by District in connection with the Project irrespective of whether the Project is producing Treated Water or not.

4.27. Fixed Financing. Long term Project Financing with fixed terms and rates extending for the length of the repayment period.

4.28. Initial Amount. The amount to be initially deposited to the Reserve and Contingency Fund pursuant to Section 12.1 and thereafter the amount currently required to be maintained in the Reserve and Contingency Fund pursuant to Section 12.1.3.

4.29. Initial Facilities. The diversion facilities, 30 million gallons per day water treatment facilities, pipelines, pumps, storage facilities, and other improvements as described in and completed during the original project pursuant to the 1992 Agreement to deliver Treated Water to City.

4.30. Maximum Annual Debt Service. The largest amount of Debt Service to be paid under Fixed Financing during any Year.

4.31. Modifications. Any improvements or alterations in the Project mandated by regulatory agencies, or required to meet the provisions of Section 9.4, or changes in the Project agreed upon as necessary by the Parties.

4.32. MRWTP. District's Modesto Regional Water Treatment Plant.

4.33. Next Turnout. The first point of diversion onto private land or into a smaller canal or pipeline below any point at which City discharges groundwater into an irrigation canal as provided in Section 9.8.1.

4.34. Other City Water. All groundwater and surface water supplies available to City for municipal and industrial purposes excluding Raw Water and Treated Water.

4.35. Parity Debt. Loans, bonds, notes, advances or indebtedness, or other obligations of City payable from and secured by a pledge of water rates, and charges of City on a parity with the obligations to be paid by City pursuant to this Agreement.

4.36. Parties. District and City.

4.37. Period. One or more Calendar Years or Domestic Water Years and/or any portion thereof.

4.38. Phases. The Design Phase, the Construction Phase, and the Commercial Operation Phase.

4.39. Policy Committee. The Committee created pursuant to Section 18.6.1 of this Agreement.

4.40. Prior Agreement. The Advance Funding and Reimbursement Agreement executed by the parties October 7, 2003, as amended, which identifies environmental review and preliminary design costs to be funded by District and later reimbursed by the First Expansion Facilities Financing.

4.41. Project. The Initial Facilities (as described in and constructed pursuant to the 1992 Agreement) plus the First Expansion Facilities. If the First Expansion Facilities are terminated pursuant to section 22.2 prior to completion, then "Project" shall mean and be limited to the Initial Facilities.

4.42. Project Manager. The person or entity as is appointed pursuant to Section 18.1.2 of this Agreement.



4.43. Project Observer. The observer or observers that may be appointed pursuant to Section 8.2.

4.44. Property Cost. As to an interest in real property either owned or acquired by City and then acquired by District for the Project pursuant to Section 7.1.2, (i) the fair market value of already owned property at the time it is conveyed to District, and (ii) the purchase price of newly acquired property, including, but not limited to, incidental costs such as legal fees, appraisal fees, and title fees.

4.45. [Not Used]

4.46. Raw Water. Water of District diverted to the Project.

4.47. Raw Water Charge. The cost of Raw Water for the year as set forth in Section 14.2.

4.48. Reserve and Contingency Fund. The reserve and contingency fund established and maintained pursuant to Section 12.1 of this Agreement.

4.49. SEIR. The Subsequent Environmental Impact Report for the MRWTP Phase Two Expansion Project dated June 2005.

4.50. Service Area. City municipal water system service areas as shown and described in the Urban Water Management Plan, as the same may be adopted by City from time to time.

4.51. Surface Water Service Area. The portion of the Service Area located within District's Irrigation District Boundary.

4.52. Study. The Water Management Study, prepared by James M. Montgomery Consulting Engineers, dated November 1984.

4.53. Sunk Costs. Those costs associated with the First Expansion Facilities incurred by the Parties and set forth in Exhibit A of this Agreement.

4.54. Technical Committee. The committee created pursuant to Section 18.6.2 of this Agreement.

4.55. Termination. A termination of the Agreement pursuant to section 22.1.

4.56. Test Period. The seven day Period immediately following the completion of the construction of the First Expansion Facilities during which those facilities are tested as to their ability to operate and produce Treated Water meeting the standards of Section 9.4 in the quantity specified in Section 9.2. If during the initial seven day Period the First Expansion Facilities fail to operate and produce Treated Water meeting the standards of Section 9.4 in the quantity

specified in Section 9.2, the Test Period shall be extended until the time when the First Expansion Facilities have in fact demonstrated their ability to operate and produce Treated Water meeting the standards of Section 9.4 in the quantity specified in Section 9.2.

4.57. TIC. "True Interest Cost" as the term is commonly applied in municipal finance.

4.58. Treated Water. All water meeting the standards of Section 9.4 delivered from the Project to City at point or points of delivery.

4.59. Trustee. The trustee or trustees, if any, appointed in the documents executed in connection with any Financing.

4.60. Urban Water Management Plan. The 2000 Urban Water Management Plan dated October 2001, which was adopted by District with District Resolution No. 2001-134 and by City with City Resolution No. 2001-480, as the same may be adopted by the parties from time to time.

4.61. Variable Financing. Project Financing with variable rates and terms during the First Expansion Facilities Construction Phase and until Fixed Financing is put in place.

4.62. Water Shortage Condition. Any Period in which pursuant to Section 17.2 the Treated Water available to City falls below 33,602.1 acre-feet during a full Domestic Water Year because of a reduction in District's water supply due to a cause beyond District's control, whether due to drought, new or amended federal or state statute or regulation, court order, federal or state government agency license, permit, order or ruling, or good faith settlement agreement in lieu of a court order or federal or state government agency order or ruling. Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), this quantity shall be changed to 67,204.2 acre-feet per year.

4.63. Year. Each 12 month period commencing on January 1 and ending on the next succeeding December 31.

## 5. TERMINATION OF PRIOR AGREEMENT.

By execution of this Agreement the Parties intend to, and do, hereby terminate and cancel the Prior Agreement, provided, that to the extent provisions of this Agreement are the same or have the same meaning as provisions of the Prior Agreement, those provisions shall be deemed to have been continuously in effect since the date of the Prior Agreement.

## 6. PROJECT AND FIRST EXPANSION FACILITIES.

6.1. Obligations of District and Expansion. Pursuant to sections 4.41 and 6.1 of the 1992 Agreement, the parties agree to expand the Project to include the First Expansion Facilities.

District shall finance, design, acquire lands and rights-of-way for, acquire licenses and permits for, construct, own, operate and maintain the First Expansion Facilities pursuant to applicable provisions of this Agreement, including, but not necessarily limited to, sections 6 through 13, inclusive and 18. In designing, constructing, operating and maintaining the First Expansion Facilities, District also shall comply with applicable provisions of the SEIR, the related mitigation monitoring plan, and Urban Water Management Plan. The configuration, design, construction, and financing of the First Expansion Facilities shall be determined in accordance with this Agreement.

6.1.1. The parties acknowledge that City intends to concurrently finance, design, acquire lands and rights-of-way for, acquire permits for, construct, own, operate and maintain certain water system transmission, distribution and storage facilities that are described and analyzed in the SEIR but not part of the First Expansion Facilities for purposes of this Agreement.

6.1.2. The Project facilities owned, operated and maintained by District and the points of delivery to City water system are shown on the map attached as Exhibit B and incorporated herein. All municipal water system facilities downstream of such points of delivery are owned by and the responsibility of City. The meters at District-City points of delivery shall be owned and operated by District as part of the Project.

6.2. First Expansion Facilities Phases. Implementation and completion of the First Expansion Facilities shall be undertaken in three Phases consisting of the Design Phase, the Construction Phase, and the Commercial Operation Phase, as described in sections 4.38 and 6 through 9, inclusive.

6.3. Area to be Served by Project. The area to be served by the Project is the Surface Water Service Area. District acknowledges that City's entire Service Area extends beyond the Surface Water Service Area, that the portions of the Service Area located outside of the Surface Water Service Area are served by City with City groundwater and City water supplies other than the Treated Water, and that the Treated Water and Other City Water are commingled in a single water distribution system that serves the entire Service Area. City shall have the right to continue to commingle the Treated Water and Other City Water for use throughout the Service Area, provided that in no event shall water from the Project be transported outside the Surface Water Service Area that is not replaced with an equal or greater amount of Other City Water in

accordance with section 17.6 below. Subject to all other limitations in this Agreement, Treated Water may be used outside the Surface Water Service Area without replacement by Other City Water if the Parties have approved that use after any environmental processing required by law has taken place.

6.4. Ownership, Assignment, and Sale of Project Water to Others.

6.4.1. District Sole Owner. District shall be the sole owner of the Project, however City shall have rights in the Project as set forth in this Agreement.

6.4.2. Sale, Transfer, or Assignment. Except as to management and operation as expressly provided in section 6.4.3, District shall not sell, transfer, or assign any interest in the Project. This section 6.4.2 does not prohibit District from disposing of excess or surplus personal property or land, provided that the proceeds of the disposition shall be credited to the Project.

6.4.3. Assignment of Management and Operations. In the event that District contemplates the assignment or transfer of the management and operation of its interest in the Project to an entity other than City, then, prior to the assignment or transfer, the Parties shall meet and confer to determine whether it is practical to make the assignment or transfer to City. District shall not assign, transfer, contract out, or subcontract all or substantially all of District's operation and maintenance obligations under the Commercial Operation Phase without the prior written consent of City.

6.4.4. Interest of City. Upon completion of the Construction Phase and during the life of this Agreement throughout the Commercial Operation Phase, including after retirement of the Fixed Financing or other debt for the Project, City shall have and continue to have a permanent beneficial interest in the output of the Project in accordance with the terms of this Agreement.

6.4.5. Assignment By City. City shall not assign or transfer its right or interest in the Project, in whole or in part, without the prior written consent of District, which consent shall not be unreasonably withheld. Any assignment or transfer by City without consent of District shall be void. No assignee or transferee of City shall obtain any right or interest in this Agreement until it assumes by written instrument all obligations under this Agreement with respect to the right or interest transferred or assigned, and it becomes a Party to this Agreement by executing this Agreement or an amendment thereto also executed by the Parties.

6.4.6. Sale of Treated Water to Other Entities. District shall not sell, lease, transfer, or in any other manner direct or convey Treated Water from the Project to any person or entity other than City without the prior written consent of City, which consent shall not be unreasonably withheld. Prior to selling, leasing, transferring, or conveying Treated Water from the Project to any person or entity other than City, District shall first offer the water to City. City may take all or a portion of the Treated Water offered. Unless parties otherwise agree, the price of any Treated Water sold, leased, transferred, or conveyed by District to any person or entity other than City shall not be less than the full cost of producing the water including Sunk Costs and Raw Water, capital, treatment, operation, maintenance, and administrative costs, and in any event shall not be lower than the price to City. In the event the cost of furnishing water to any person or entity other than City is less than the charges to that person or entity, the excess revenue shall be applied to the operation of the Project. Subject to the provisions of Section 6.4.5, this Agreement shall inure to the benefit of and be binding upon the Parties and their respective successors and assignees.

6.5. Disposition of Plans. City, upon request, shall be entitled to obtain and keep copies of all reports, drawings, studies, plans, specifications, other engineering documents, and all other documents pertaining to the Project, provided that City has fully paid its share of all costs due up to the time of the request, as those costs are due and owing pursuant to this Agreement.

6.6. Cooperation in Proceeding with First Expansion Facilities. District shall, to the extent it has not already done so, utilize its best efforts to acquire and maintain ownership of all easements, water conveyance rights, water rights, and Approvals necessary for the construction, operation, and maintenance of the First Expansion Facilities. City shall utilize its best efforts to support the First Expansion Facilities and its Financing and assist District in regard to the matters set forth in this Section 6.6 in order to facilitate the Financing, construction, operation, and maintenance of the First Expansion Facilities.

## 7. DESIGN PHASE.

7.1. Design Phase Work. Under the Advance Funding and Reimbursement Agreement, Design Phase work on the First Expansion Facilities has been commenced and is currently under way. District has retained various engineers and consultants to perform the work. District may utilize different engineers and consultants on the First Expansion Facilities, subject

to City's approval of engineering services contracts pursuant to Agreement section 18.3.1. To the extent items are not already completed or under way, during the Design Phase each of the following shall occur:

7.1.1. District to Obtain Approvals. To the extent practical, District shall obtain all Approvals during the Design Phase. Approvals, which cannot be obtained during Design Phase, shall be obtained as soon thereafter as practical.

7.1.2. Property Interests. District shall acquire all land, easements, and rights of way required for the construction, operation, and maintenance of the First Expansion Facilities including real property interests owned by City where applicable. City shall assist with the identification and acquisition of all water storage sites within its respective Service Areas. If City either acquires real property for District's portion of the First Expansion Facilities, or agrees to the utilization of already owned property for District's portion of the Project, then District shall acquire the real property from City at the Property Cost.

7.1.3. Preliminary and Final Design. The First Expansion Facilities engineers shall prepare preliminary design development plans and specifications and a preliminary cost estimate, and, after approval by the Parties of the preliminary design and cost estimate as provided in Sections 18.3 and 18.4, the engineers shall prepare final and complete construction documents and a final cost estimate.

7.1.4. Preliminary Financing Work. The financial advisor, underwriter, bond counsel, and District shall perform preliminary work necessary for the Financing of the First Expansion Facilities and shall make a Financing proposal to City.

7.2. Costs for Design Phase to be Advanced. Costs for all work performed during the Design Phase shall be advanced in accordance with the provisions of Section 10.1.

7.3. Reimbursement of Advanced Design Phase Costs. Reimbursement of the costs advanced pursuant to Section 10.1 shall be made in accordance with Section 10.2. The SEIR and First Expansion Facilities environmental review costs shall be considered design costs to be advanced by District and reimbursed pursuant to sections 4.1, 7.2, 7.3, 10.1 and 10.2; provided, however, that SEIR, First Expansion Facilities environmental review and other costs paid or advanced by City pursuant to the Prior Agreement shall not be reimbursed to District, but shall be reimbursed to City through the First Expansion Facilities Financing.

8. CONSTRUCTION PHASE.

8.1. Finalization of Financing and Construction. The Construction Phase shall consist of finalization of the Financing and the construction of the First Expansion Facilities. Prior to the commencement of the Construction Phase all necessary agreements for the Financing and construction, purchase, and sale of water, and operation and maintenance of the First Expansion Facilities shall be executed.

8.2. First Expansion Facilities Observer. City may designate a First Expansion Facilities Observer to function during the Construction Phase. City shall pay all costs for the First Expansion Facilities Observer, including, but not limited to, salary and fringe benefits. A First Expansion Facilities Observer may: (i) be at the construction site of the First Expansion Facilities at any time he/she elects; (ii) observe on-going and completed construction; and (iii) have access to all of District's records, files, and documents related to the design and construction of the First Expansion Facilities. He/she shall not direct, comment to, correct, advise, or otherwise deal with personnel of any contractor or District except that the First Expansion Facilities Observer may bring to the attention of the Project Manager any concerns noted by him/her and may bring those concerns to City. The First Expansion Facilities Observer shall observe all applicable requirements of the Occupational and Health Safety Act and all other statutes, rules, and regulations applicable to employee safety on construction sites. The Project Manager may exclude from the construction site any First Expansion Facilities Observer who, after warning, fails to observe the limitations and requirements of this Section 8.2.

9. COMMERCIAL OPERATION PHASE

9.1. Commercial Operation Phase. District shall continue the Commercial Operation Phase as to the Initial Facilities. The Commercial Operation Phase for the First Expansion Facilities shall commence immediately following the Test Period. Any water produced during the Test Period, which meets the standards of Section 9.4, shall be delivered to City.

9.2. Test Quantity. During the Test Period after completion of the First Expansion Facilities, Treated Water from the MRWTP shall be produced at a rate of 60 million gallons per day or at the highest rate below 60 million gallons per day which City system is able to accept. During the Test Period every reasonable effort shall be made to produce Treated Water at the rate of 60 million gallons per day. The Parties shall cooperate during the Test Period in an effort to maximize production of water and acceptance of water by City system.

9.3. District Obligations During Commercial Operation Phase. During the Commercial Operation Phase District shall: (i) operate and maintain the Project in as economic a manner as practical in accordance with generally accepted waterworks practices as evidenced by well designed and operated potable water treatment plants of a similar size in Northern California; and (ii) deliver Treated Water to City consistent with the terms of this Agreement. Until the Commercial Operation Date for the First Expansion Facilities, District's operation and maintenance responsibilities shall be limited to the Initial Facilities. After the Commercial Operation Date for the First Expansion Facilities, District's operation and maintenance responsibilities shall include the First Expansion Facilities.

9.4. Standards of Treated Water. Throughout the term of this Agreement, or any successor or substitute agreement, or extensions thereof, District shall deliver to City Treated Water which meets all state and federal drinking water quality standards applicable to the Project at the time of delivery to City system.

9.5. Obligation of City to Take Water. City at all times shall exercise its best efforts to take all Treated Water made available to City, up to the amount identified in Sections 14.8 and 17.3.

9.6. Cooperation in Operation. The Parties shall cooperate and remain in frequent telephonic or other communication so as to efficiently operate the domestic water system and fully put to use the Treated Water produced by the MRWTP.

9.7. Expansion of Groundwater Capacity and Commingling of Groundwater. Throughout the term of this Agreement, City shall maintain and, to the extent it deems necessary, expand, its well system so that the groundwater used in conjunction with the Treated Water will best enable City to be able to meet its customer demands. It is understood that District's obligations to deliver Treated Water are as otherwise set forth in this Agreement. Groundwater is to be delivered by City through its same water pipelines which will carry the Treated Water, resulting in a physical commingling of the groundwater and surface supplies.

9.8. Exchange of Groundwater for Treated Water. Subject to the absolute limitation of 67,204.2 acre feet per Domestic Water Year, and subject to approval of District as to time and place of delivery, which approval shall not be unreasonably withheld, City, at its option, may deliver groundwater to District irrigation canal system in exchange for an additional amount of



Treated Water from District equal to the quantity of groundwater delivered to District irrigation canal system, provided that each of the following conditions is met:

9.8.1. Delivery. Any groundwater delivered by City shall be delivered into one of the irrigation canals of District. After blending the groundwater discharged with the water then in the canal, the quality of the water, sampled at the Next Turnout, shall be of a quality suitable for agricultural use, including without limitation, use for crops, orchards or livestock.

In the event that water samples at the Next Turnout demonstrate, based upon the quality standards set forth above, that the groundwater after mixing is not suitable for agriculture, City shall immediately cease making those discharges which contribute to the unsuitability of the water at the point at which the sampling occurred

9.8.2. Costs. City shall bear all costs, including the cost of additional capital facilities, if any are necessary, associated with delivering exchange groundwater supply to District irrigation canal system.

9.8.3. Records. City shall maintain a record of the quantity of exchange groundwater delivered to District irrigation canal system and the quality of blended water in the canal at the Next Turnout below each point of introduction of groundwater.

9.8.4 Use of District Pumps. In order to facilitate the exchange of groundwater pursuant to this Section 9.8, City may enter into an agreement with District for the use of District owned or controlled pumps to accomplish the exchange. City shall reimburse District for all costs incurred, including electric rates normally charged for pumping and costs of operations, maintenance, repair, administration, and personnel. Agreements pursuant to this Section 9.8.4 shall be at the sole discretion of District.

9.9. Force Majeure. District shall be excused from its obligation to deliver Treated Water in the event that District is rendered unable, wholly or in part, by force majeure to carryout its obligations under this Agreement. Upon the occurrence of an event of force majeure, District shall give notice and full particulars of the force majeure in writing, or by telephone followed by a writing. District's performance shall be suspended during the continuance of the force majeure. The term "force majeure" as used herein shall mean acts of God, strikes, lock-outs, failure or refusal of any person or entity to comply with then existing agreements to obtain or ship materials or equipment, or industrial disturbances, acts of a public enemy, wars, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, volcanic eruptions,

fires, flood, washouts, or other natural disasters, threat of physical harm or damage resulting in the evacuation or shutdown of facilities necessary for the supply, treatment, and distribution of water, arrests and restraints of governments and people, civil disturbances, insurrection, explosions, sabotage, restraint by court order or public authority, other than District, having jurisdiction over the Project, and action or non-action by, or failure to obtain authorizations or approvals from, any governmental agency or authority of competent jurisdiction, and any other causes, whether of the kind herein enumerated or otherwise, not within the control of the Party claiming force majeure and which, by the exercise of due diligence, the Party is unable to prevent or overcome. District shall use its best efforts to promptly bring to an end any condition falling within the definition of force majeure. District shall prepare, revise from time to time as appropriate, and implement when necessary an operational plan to deal with strikes and lockouts so as to minimize interruption of the delivery of Treated Water to City in the event of a strike or lockout. It is understood and agreed that the settlement of strikes or lockouts shall be entirely at the discretion of the Party having the difficulty. In the event of a strike or lockout, District's obligation to perform under this Agreement shall not be suspended for a Period of more than 60 days. If District gives notice of a force majeure event which impacts District's ability to deliver Treated Water, then the provisions of Section 13 shall be determinative as to whether City is excused from its obligation to pay Debt Service and Fixed Costs. Upon the occurrence of any event of force majeure which may render District wholly or in part unable to carry out its obligations under the Agreement, to the extent reasonably practical District shall use its best efforts to promptly implement a plan to ensure the continued operation of the Project and continued delivery of Treated Water to City.

10. ADVANCE OF PRE-CONSTRUCTION COSTS.

10.1. Advances by District, City, Sunk Costs, and Approval of Other Costs. City shall be liable for the payment of all costs and expenses of all Phases of the Project in accordance with this Agreement. To facilitate the planning and construction of the First Expansion Facilities, and pursuant to the Prior Agreement, District has already advanced certain First Expansion Facilities costs. Some costs have been advanced by City. District shall advance all costs reasonably necessary for completion of all engineering and design work, feasibility studies, permit, and licensing costs, and all other work required and conducted during the Design Phase of the First Expansion Facilities. The costs shall be reimbursed by City as set forth in Section 10.2; however,

in order for costs incurred by District to be reimbursed by City, the costs must be either included as Sunk Costs identified in Exhibit A or approved by City. Separate approval shall not be required as to costs approved as a part of a Project milestone as provided in Sections 18.3 and 18.4. Any cost not approved by City shall be subject to further review in the manner provided in Section 18.6. As also indicated on Exhibit A, City has also advanced a portion of Sunk Costs.

10.2. Reimbursement. Upon Termination, City shall reimburse District for all Sunk Costs and Advances not previously reimbursed or incorporated into a Financing, unless the Parties agree otherwise. In the event of a Termination of the First Expansion Facilities pursuant to Section 22.2, and the Parties abandon the First Expansion Facilities, City shall not be required to reimburse District pursuant to this Section 10.2. If the Project proceeds to Financing, reimbursement of Sunk Costs and Advances to District and reimbursement of Sunk Costs to City shall be included in the principal amount of the financed obligation. District and City shall be reimbursed for Sunk Costs and District shall be reimbursed for Advances from the proceeds of the Financing.

10.3. Interest on Advances. Amounts advanced by the Parties pursuant to Section 10.1 shall bear interest at District Interest Rate until repaid.

10.4. Costs of Studies and Negotiation Borne by Each Party. Costs of studies conducted by either Party for its own purposes and costs associated with the preparation and negotiation of this Agreement or subsequent or other agreements between the Parties shall be borne by the Party incurring the costs and shall not be advanced pursuant to Section 10.1, nor reimbursed pursuant to Section 10.2.

## 11. DRAINAGE.

11.1. Responsibility. District shall not be responsible for any drainage pumping or facilities necessary to maintain water tables so as to avoid damage to structures and crops within the Service Area of City. City shall not be responsible for any drainage pumping or facilities necessary to maintain water tables so as to avoid damage to structures and crops outside the Service Area of City.

11.2. Indemnification. Each Party shall indemnify, protect, defend, and hold harmless the other Party, and its respective officers, directors, officials, employees, agents, and volunteers, from and against any and all liabilities, claims, damages, losses, judgments, penalties, costs or expenses (including attorney fees) arising from rising groundwater tables within the service area

of the indemnifying Party. For the purposes of this Section 11.2, District's service area shall be that portion of District lying outside of the Service Area of City.

12. RESERVE FUNDS.

12.1. Reserve and Contingency Fund. District shall continue to maintain a Reserve and Contingency Fund. The Initial Amount shall be \$500,000.

12.1.1. Additional Deposits to Reserve and Contingency Fund. If the balance in the Reserve and Contingency Fund shall fall below the Initial Amount as of the end of any Year, then the amount of the shortfall shall be added to the amount to be paid by City pursuant to Section 15 during the next ensuing Domestic Water Year.

12.1.2. Withdrawals From Reserve and Contingency Fund. The Reserve and Contingency Fund shall be subject to withdrawals by District for the following purposes:

12.1.2.A. Unbudgeted Items. The cost of (i) unbudgeted necessary repairs and replacements required to maintain the Project in good order in keeping with the standards evidenced by similar sized potable water treatment plants in Northern California and at all times able to produce Treated Water meeting the standards of Section 9.4; plus (ii) all unbudgeted Modifications.

12.1.2.B. Costs in Excess of Budget Amount. Costs, including, among other things, Fixed Costs and Debt Service, for the operation and maintenance of the Project, which exceed the funds available pursuant to Section 15 for any Period.

12.1.2.C. Budgeted Items. The cost of budgeted repairs, replacements, and Modifications if so agreed by all of the Parties.

12.1.3. Increase or Decrease in Reserve and Contingency Fund. From time to time, as a part of and subject to the budget process set forth in Section 18.7.2, District may, if experience reasonably indicates, increase or decrease the Initial Amount and in the event of an increase in the Initial Amount, provide for necessary additional payments by City during the next ensuing Domestic Water Year so as to increase the balance in the Reserve and Contingency Fund. In the event of a decrease in the Initial Amount, the excess balance in the Reserve and Contingency Fund shall be credited against payments due from City during the next Domestic Water Year.

12.1.4. Reserve and Contingency Fund Advances. If at any time because the Reserve and Contingency Fund is depleted or contains insufficient funds so that District must

advance funds which otherwise would be obtained from withdrawals from the Reserve and Contingency Fund under Section 12.1, then the aggregate amount of the advances during any Year and the amount necessary to replenish the Reserve and Contingency Fund to its established balance shall be added to the amount to be paid by City pursuant to Section 15 during the next ensuing Domestic Water Year. The amount of advances by District to the Reserve and Contingency Fund while outstanding shall bear interest at District Interest Rate. Funds received monthly by District by payments from City pursuant to this Section 12.1.4 shall be applied first to interest and then to the replenishment of the Reserve and Contingency Fund.

12.1.5. Interest on Reserve and Contingency Fund. Funds in the Reserve and Contingency Fund shall be invested by District and actual interest earned on the funds shall be credited to the Reserve and Contingency Fund.

12.1.6. Reports. District shall submit to the Technical Committee no less often than quarterly a report setting forth the current balance of the Reserve and Contingency Fund, income and expenditures from the Fund, and anticipated expenditures, if any during the remainder of the year.

12.2. Debt Service Reserve Fund. District shall establish and maintain a Debt Service Reserve Fund. There shall be deposited into the Debt Service Reserve Fund from the Fixed Financing, an amount equal to the Maximum Annual Debt Service. The Debt Service Reserve Fund shall be held by the Trustee. If the First Expansion Facilities proceed to Financing, then the amount of the Debt Service Reserve Fund under this section shall be increased by an amount equal to the Maximum Annual Debt Service for the Fixed Financing of the First Expansion Facilities. In the alternative, District may establish and maintain under this section a second, separate Debt Service Reserve Fund in this amount for the First Expansion Facilities.

12.2.1. Withdrawals From Debt Service Reserve Fund and Replenishment of Debt Service Reserve Fund. Withdrawals from the Debt Service Reserve Fund shall only be made for the purpose of making current payments of Debt Service obligations. If any such withdrawal is made from the Debt Service Reserve Fund, due at any time that funds available under the provisions of Section 15 and/or Section 12.1 are insufficient to meet current Debt Service Reserve Fund, City shall pay pursuant to Section 14.1 and Section 15.1 that amount necessary to replenish the amount on deposit in the Debt Service Reserve Fund to an amount

equal to the Maximum Annual Debt Service no later than one year following such withdrawal from the Debt Service Reserve Fund.

12.2.2. Interest On Debt Service Reserve Fund. Funds in the Debt Service Reserve Fund held by the Trustee shall be invested by District and actual interest earned on the funds shall be credited annually as a part of each Year's budget to sums otherwise due from City pursuant to Section 15 after deducting from interest earnings any amounts which must by law be paid to the United States. It is anticipated that the Debt Service Reserve Fund will be invested in an investment vehicle such as Guaranteed Investment Contingent Fund or a state and local government securities fund.

12.2.3. Final Disposition. The balance on hand in the Debt Service Reserve Fund shall be applied to the final payment or payments of Debt Service.

12.2.4. No Duplication. To the extent the Financing documents provide for a Debt Service Reserve Fund, the provisions of the Financing documents shall prevail. In the event that any reserve requirements set forth in any Financing documents duplicate or parallel the requirements of this Section 12.2, it is agreed that in no event shall contributions to the Debt Service Reserve Fund and any similar fund exceed an aggregate amount equal to the Maximum Annual Debt Service.

### 13. FINANCING AND TAKE OR PAY PROVISION.

13.1 District to Arrange Financing, Take or Pay Provision, Excuse from Take or Pay. District, subject to Section 18.5, shall use its best efforts to arrange Financing for the construction of the First Expansion Facilities using bonds or other evidences of indebtedness or certificates of participation, which shall be secured in part by the provisions of this Agreement.

City shall pay the Fixed Costs and Debt Service of the Project whether or not the Project or any part of it is operating or operable or its output or capability is suspended, interrupted, interfered with, reduced or curtailed, or terminated in whole or in part except as excused below. The payments of Fixed Costs and Debt Service shall not be subject to reduction whether by offset, counterclaim, recoupment, or otherwise and shall not be conditioned upon the performance or nonperformance by either Party to any agreement or for any other cause or reason whatsoever. The "take or pay" obligation of City with respect to Debt Service shall commence at the time that Debt Service payments actually commence under the applicable Financing. The "take or pay" obligation of City with respect to Fixed Costs shall commence at

the time of the commencement of the Commercial Operation Phase, which shall occur at the end of the Test Period. City shall not be required to pay Debt Service or Fixed Costs if any of the following specific conditions shall occur:

13.1.1. Excuse, 50 Percent of Contracted Water Not Delivered. District for any reason other than Drought shall fail to deliver at least 50% of the Treated Water that City is scheduled to receive for any Domestic Water Year (as determined pursuant to sections 17.1 and 17.2 of the Agreement) for a Period in excess of 18 consecutive months. For purposes of this provision, the particular Domestic Water Year shall be that year in effect at the beginning of the 18-month term.

13.1.2. Excuse, 50 Percent of Water Supply. 50 percent or more of District's total annual water supply, as adjusted as provided in Section 17.2 shall be lost or unavailable for physical reasons beyond District's best efforts to control, other than Drought, for a Period in excess of 24 consecutive months.

13.1.3. Excuse, 80 Percent of Water Treatment Plant Destroyed. 80 percent or more of the water treatment plant, which is a part of the Project, shall be destroyed or disabled for a period in excess of 24 consecutive months.

13.2. New Period of Excuse. A new 18 month, and if applicable, 24 month Period, shall not commence for the purpose of Section 13.1 until a consecutive 12 month Period, during which at least 75 percent of the Treated Water which City is to receive pursuant to Sections 17.1 and 17.2 of this Agreement has been delivered, has passed.

#### 14. PAYMENT FOR WATER BY CITY.

In exchange for District agreeing to make available to City Treated Water in the manner set forth in this Agreement, City shall pay each Domestic Water Year in equal monthly installments the sum of the items set forth below. The sum shall be calculated and paid to District as set forth in Section 15 regardless of the amount of Treated Water actually delivered to City, or, subject to the exceptions found in Section 13.1, whether any Treated Water is delivered. The sum to be paid shall be comprised of the following:

14.1. Debt Service. Debt Service, so long as there is outstanding indebtedness incurred by District in connection with the Project, plus the amounts, if any, necessary to replenish the Debt Service Reserve Fund pursuant to Section 12.2.1.

14.2. Raw Water Charge. District shall charge City for Raw Water at the same rate as District charges for water furnished by District to its agricultural water users. The Raw Water Charge shall be charged only for water actually delivered to the Water Treatment Plant. In setting the rates for Raw Water, District shall be guided by the following principles:

- (i) The economy of District is, to a great extent, dependent upon fair, reasonable, and economical irrigation water rates, and District, in setting such irrigation water rates shall be mindful of the impact that increases in water rates would have on agriculture and the economy of District.
- (ii) District shall not derive a profit from its Raw Water diverted to the Project.
- (iii) City shall be fully advised through the budget process set forth in Section 18.7 of the proposed water rates to be set by District.
- (iv) The rates established for Raw Water and water furnished to District's agricultural water users shall be adopted by the Board only after a public hearing for which at least ten days' notice has been given in writing to City.
- (v) Water rates shall be fair, reasonable, and economical as to both District's agricultural water users, and to City.

In order to observe the foregoing principles, it will be necessary to convert the agricultural water users supply to acre feet and the agricultural water users charge to a "per acre foot charge." The cost of Raw Water shall then be calculated as follows:

14.2.1. Agricultural Allocation in Acre Feet. District provides a water supply to its agricultural water users during each irrigation season. In some seasons, it is possible to allow irrigation water to each agricultural water user to the extent of demand. In other seasons it is found necessary by the Board to allocate, that is to reduce, the amount of water available to agricultural water users. When allocation is necessary it is the practice of the Board to announce, usually in March or April, the allocation for the season allowing a certain number of inches of water for the season for each agricultural acre to which agricultural water is provided. For the purposes of this Agreement, if no allocation of agricultural water is announced for any agricultural season, then the allocation for that season shall be presumed to be 42 inches. The



allocation for agricultural water for each irrigation season shall be converted to acre feet by taking the number of inches of water allocated and dividing by 12. In some Years the Board may provide for an allocation on an optional basis. For example, the Board may provide for a base supply of 33 inches of water for each agricultural acre at a charge of \$7.50 per acre with an option of up to another 12 inches for \$7.50 per acre with a limited option in certain cases for additional water at \$15.00 per acre-foot. Under such an allocation, a maximum allocation of 42 inches would be assumed and the allocation of 42 inches would be divided by 12 to obtain acre-feet.

14.2.2. Acre Foot Charge. Presently, District charges for water furnished to agricultural water users on a per acre basis; Raw Water furnished pursuant to this Agreement shall be charged on a per acre foot basis. Accordingly, the per acre charge for agricultural water set for each irrigation season by District shall then be divided by the number of acre feet derived pursuant to Section 14.2.1 and the result shall be the charge for each acre foot of Raw Water supplied to the Project for that irrigation season. In the event of an allocation similar to the example, as described in Section 14.2.1, the first 33 inches would be divided by 12 and the quotient would be divided into \$7.50. The remaining nine inches of the total of 42 inches would be divided by 12 and would be charged at the rate of \$7.50 per acre-foot.

14.2.3. Irrigation Season not Concurrent with Year. Each irrigation season, depending upon need, commences at some time after the beginning of each Year. Thus, two Raw Water rates may be applicable for portions of each Year; the actual Raw Water charges for each Year shall be calculated accordingly.

14.2.4. Raw Water Charge not Applicable. Treated Water delivered in exchange for groundwater delivered to District irrigation canals pursuant to Section 9.8 shall be subject to the same costs as all other Treated Water except there shall be no charge for Raw Water provided for in this Section 14.2.

14.2.5. Change in Method for Charging for Agricultural Water. In the event that District adopts a new method of charging for, or allocating, agricultural water, the Parties shall agree upon a new method of calculating the Raw Water charge devised so that the Project shall bear the same cost per acre foot as is borne by the agricultural water users of District.

14.2.6. Measurement of Raw Water. Raw Water shall be measured at its point of entry into the MRWTP.

14.3. Operation and Maintenance Costs. The actual operation, maintenance, repair, replacement, and Modification costs directly attributable to the operation of the Project for the Year, less sums drawn against the Reserve and Contingency Fund pursuant to Section 12.1.2, except any sum drawn against the Reserve and Contingency Fund for Debt Service. It is agreed that no item for depreciation shall be included in the sums calculated and paid pursuant to this Section 14 and Section 15.

14.4. Administrative Services. An amount equal to the reasonable actual cost of administrative services fairly attributable to the operation of the Project and the administration of this Agreement including, but not limited to, legal, accounting, and consulting engineering services, and the actual cost of paying agents or other services which District requires in processing and making payments to the holders of indebtedness incurred by District in connection with the Project.

14.5. Insurance. The actual cost of all insurance required by this Agreement to be maintained by District.

14.6. Electric Energy. The cost of electric energy provided to the Project. Electric energy will be provided by District. District shall charge the Project, from time to time, consistent with District policy as to use and applicable rate structure and cost the same as would be charged to District itself.

14.7. Other Payments and Costs and Deductions From Payments and Costs. The amount of payments or costs and deductions from payments or costs specified by Sections 12.1.1, 12.1.3, 12.1.4, and 12.2.2, and 16.3.2.

14.8. Payments by City to District for Raw Water Only. To assist District in planning its budget, City will pay District on an annual Domestic Water Year basis in accordance with the following:

1. City shall estimate and provide its estimate to District no later than thirty (30) days prior to the commencement of each Domestic Water Year, its anticipated usage of Treated Water.
2. District shall multiply the raw water charge determined in accordance with Section 14.2, above, by City's estimate to obtain a total estimated annual Raw Water Charge to City for budget planning purposes.

3. At the end of each Domestic Water Year, District shall calculate City's actual total Raw Water Charge in accordance with Section 14.2 of this Agreement, based on actual Raw Water used and use this cost for calculation of City's payments pursuant to Sections 15.3 and 15.4.

14.9. First Expansion Facilities. Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), the application of the billing and payment provisions in this section shall be modified to provide for billing and payment to include the operation and maintenance of the First Expansion Facilities.

15. TIME AND MANNER OF PAYMENT BY CITY TO DISTRICT.

15.1. Monthly Payments. Payment of the total sum due for each Year pursuant to Section 14 shall be as set forth in this Section 15. Each monthly payment to be made pursuant to this Section 15 shall be made on the first day of each month.

15.2. Proration. Any payment made pursuant to this Agreement which covers less than a full month or which covers less than a Year shall be prorated accordingly.

15.3. Calculation of Monthly Payments. Prior to December 31 of each Year, District shall prepare and adopt a budget for the forthcoming Year pursuant to section 18.7 of this Agreement. The budget shall include all of the items listed in section 14. The budget for a Year shall determine and set forth a monthly payment amount to be made by City which shall be the net amount of budgeted expenses for the Year, less any refunds or credits allowed to District in connection with the Project pursuant to the Agreement, divided by 12. Each Year, the new monthly payment calculated as provided in this section 15.3 shall take effect at the beginning of the next ensuing Domestic Water Year (i.e., the new monthly payment for a Year shall take effect on May 1 of that Year). Regarding the First Expansion Facilities, (a) the budget and City payments shall be increased to include Debt Service for the First Expansion Facilities Financing for the Year in which the Debt Service payments for such Financing become due, and (b) the budget and City payments shall be increased to include the other expense items for the First Expansion Facilities listed in section 14 after the Commercial Operation Date for the First Expansion Facilities.

At the conclusion of each Year, District shall prepare an accounting of the actual expenses for the Year as compared with the Year's budget and City payments for the Year, and determine whether City made overpayments or underpayments for the Year based on the actual

City payments compared to actual expenses. City shall pay the amount of any underpayment for a Year in a lump sum payment to District. District shall pay the amount of any overpayment for the Year in a lump sum payment to City. The amount of any such overpayment or underpayment shall be reflected in the first invoice for the Domestic Water Year immediately following the completion of the accounting, and shall be due and payable at the time payment of such invoice is due and payable.

15.4 Late Payments. Any amounts owed by one Party to the other Party under this Agreement that is not paid in full when due shall thereafter bear interest at the rate of 1% per month of the unpaid balance, or at the maximum lawful rate, whichever is less.

16. GENERAL PAYMENT PROVISIONS.

16.1. Percentages. [Not Used].

16.2. Records. District shall (i) keep and maintain and provide to City detailed cost accounting reports documenting the Project costs, (ii) keep and maintain separate accounting and bookkeeping records with a separate account and fund for the Project, and (iii) allow City and its employees, accountants, attorneys and agents to review, inspect, copy and audit the accounting and bookkeeping records of District, including all source documents. District shall have the right to review, inspect, copy, and audit all accounting and bookkeeping records of City, including all source documents, as may pertain to the receipt, delivery, and sale of water received from the Project.

16.3. Security for Payment, Rate Covenant by City. Prior to obtaining the Financing for the First Expansion Facilities as set forth in Section 13.1, District shall be entitled to the assurances it may reasonably deem necessary, and be entitled to the financial information as may be necessary, to ascertain that City is in the financial condition as will allow it to fulfill its financial commitments to the First Expansion Facilities.

16.3.1. [Not Used]

16.3.2. Security from City. City's security obligation pursuant to this Section 16.3 shall be satisfied by the following rate covenant and pledge of City Gross Water Revenues which shall be effective and binding upon City upon the execution of this Agreement by the Parties:

16.3.2.A. Rates and Charges. City shall fix, prescribe, and collect water rates and charges which shall be at least sufficient to yield City Gross Water Revenues during

each fiscal year of City in an amount equal to: (i) the payment obligations of City under this Agreement during the fiscal year other than Debt Service; (ii) City maintenance and operations costs to the extent not included in clause (i) above; plus (iii) one hundred twenty-five percent (125%) of the Debt Service to be paid during the fiscal year.

16.3.2.B. Pledge. All City Gross Water Revenue and all money on deposit in the funds established by this Agreement are hereby irrevocably pledged to the punctual payment of the interest on and principal of and redemption premiums if anyone the obligations evidencing the Financing and all obligations of City under any Parity Debt. This pledge shall constitute a lien on and security interest in City Gross Water Revenues and funds established by this Agreement and shall attach, be perfected, and be valid and binding from and after the consummation of the Financing or the issuance of Parity Debt, without any physical delivery thereof or further act. If City gives any additional collateral to secure the payment of the Financing, City agrees that such collateral shall also secure all obligations of City under any Parity Debt on a pari passu basis.

16.3.2.C. Similar Covenant. City hereby covenants and agrees that it shall require a covenant substantially similar to clauses (i), (ii), and (iii) of Section 16.3.2.A with respect to all Parity Debt.

16.3.2.D. Parity Debt. In addition to its obligations hereunder, City may issue or incur Parity Debt in such principal amount as shall be determined by City in accordance with Section 16.3.2.C.

16.3.2.E. Subordinated Debt. In addition to its obligations hereunder, City may issue or incur loans, bonds, notes, advances or indebtedness payable from City Gross Water Revenues on a junior and subordinated basis with its obligations hereunder in such principal amount as shall be determined by City.

16.3.2.F. Amendment To Obtain Financing. This Section 16.3.2 may be amended from time to time by the Parties to the extent necessary to obtain the Financing as set forth in Section 13.1 and, after the Financing is obtained and so long as it remains unpaid, may only be amended in accordance with the terms and conditions of the legal documents for the Financing.

16.3.2.G. Alternative Security. City may be relieved from its obligation to perform any of the covenants set forth in this Section 16.3.2 by providing to District for

deposit with Trustee a policy of municipal bond insurance, irrevocable letter of credit, surety bond or similar credit facility assuring payment of Debt Service due and payable by City pursuant to this Agreement, and which is acceptable to District and Trustee in accordance with the terms and conditions of the Financing.

17. DELIVERY OF WATER.

17.1. Water Supply to City. Subject to Sections 4.41 and 17.2, District shall make available to City an amount of Treated Water equal to 30 million gallons per day. District shall consult with City on a regular basis during the Commercial Operation Phase to determine the schedule of deliveries, and, consistent with the terms of this Agreement, District shall use its best efforts to meet the requirements of City. Notwithstanding any other provision of this Agreement, in a Drought situation the delivery of surface water by District for agricultural uses to its agricultural customers and for municipal uses to City shall be reduced in equal proportions in accordance with the formula in Section 17.2.

Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), the Treated Water quantities as set forth in sections 17.1 to 17.7 shall be changed from 33,602.1 acre-feet per year and 30 million gallons per day to 67,204.2 acre-feet per year and 60 million gallons per day.

District promises and agrees to treat District's agricultural customers and City on a parity basis. If District is required to reduce deliveries, it will cut back its deliveries to its agricultural customers and to City in equal proportions. In keeping with the foregoing, District agrees that its commitments to its agricultural customers and to City shall be met before any subsequent water transfers for delivery of water outside District's boundaries. It must be understood, however, that "transfers" between District and Turlock Irrigation District made in the ordinary course of operations are not included in the foregoing, as District and Turlock Irrigation District regularly deliver water to each other in the interest of maximizing beneficial use of their water rights and facilities.

17.2. Formula for Water Allocation. During each Domestic Water Year, District shall make available to City 33,602.1 acre feet of Treated Water provided that the allocation of City shall be reduced in any Domestic Water Year that the following calculation results in a sum less than 33,602.1 acre feet:

$$(Y/42) \times 33,602.1 = X$$

"Y" shall be the actual number of inches of water allocated by the Board to agricultural water users for the subject irrigation season commencing immediately prior to each Domestic Water Year. In the event a portion of the water allocation is optional as in 1991 as described in Section 14.2.1 and the fixed and optional amounts equal or exceed 42 inches, then City shall be assumed to have exercised the available option up to a total of 42 inches for the purposes of the above calculation. If no allocation is made for any irrigation season, the allocation shall be presumed to be 42 inches. The actual maximum Treated Water allocation of City for the subject Domestic Water Year shall be 33,602.1 acre feet of Treated Water or the amount calculated as "X" in the above formula, whichever is less. It is anticipated that from time to time District may modify its current agricultural water allocation. When District makes changes in its agricultural water allocation that result in the above allocation formula no longer ensuring that reductions or increases in available water are in equal proportions as between District's agricultural customers and City, subject to the limitation of 33,602.1 acre feet of Treated Water, the Parties shall meet and confer and agree upon necessary changes in the above allocation formula so as to ensure that reductions and increases in available water are in equal proportions as between District's agricultural customers and City.

Except as provided in Section 17.3, in no event shall District be required to make available to City, more than 33,602.1 acre feet of Treated Water for First Expansion Facilities during any Domestic Water Year. If the applicable formula during any Domestic Water Year provides for an annual allocation of less than 33,602.1 acre feet, there shall be no suspension in the payment obligations of City, set forth in Section 14, regardless of the length of the Period during which deliveries of Treated Water shall be less than 33,602.1 acre feet for each Domestic Water Year. Nothing contained in this Section 17.2 shall be deemed to modify in any way District's right to suspend, curtail, or reduce water deliveries as provided in Section 9.9 and in this Section 17.2. Nothing in this Agreement shall be construed to require District to curtail deliveries of water during any Period.

17.3. Treated Water Delivery Schedule. The parties acknowledge that City's water needs vary throughout the Domestic Water Year with high peak day demands in summer and lower demands in winter. City shall have the right to specify, on a daily basis, its water delivery requirement for the following day (or longer period of time as agreed between the parties) and

District shall be obliged, subject to its engineering, operating, maintenance, regulatory, safety and other practical requirements, to make a good faith effort to meet the daily (or longer period) demands specified by City.

17.4. Adjustment of Curtailment. In the event that a severe and prolonged drought threatens the ability of City to deliver adequate drinking water to its customers despite its efforts to impose rationing and to utilize all water resources available to it, the Parties shall meet and confer to determine whether, and upon what terms, water allocations other than those provided for in this Agreement could be implemented which would alleviate hardships to the customers of City without unduly or disproportionately injuring agriculture. In the event that water deliveries during a Domestic Water Year must be curtailed pursuant to Section 17.2, for the reasons set forth in the preceding sentence or for any other reason, the Parties shall meet and confer for the purpose of reaching an agreement as to an alternative curtailment formula or water allocation basis which more equitably and more fairly meets the then current needs of the agricultural and municipal water users within District's boundaries. The Parties shall also endeavor to reach agreement upon other terms and conditions necessary to implement an agreement. The duration of an adjustment agreement shall be specified in the agreement. In the event that no agreement can be reached, the deliveries shall be curtailed in accordance with the formula set forth in Section 17.2 of this Agreement.

17.5. Exchange for Groundwater. During a Domestic Water Year in which City's allocation is reduced below 33,602.1 acre feet of Treated Water, City shall continue to have the option to deliver groundwater to the irrigation canal system in exchange for additional surface water as provided by Section 9.8.

17.6. Water to Remain in District's Irrigation District Boundary. No Treated Water delivered by District to City, not offset by City groundwater and City water supplies other than the Treated Water within District's Irrigation Boundary, shall be allowed to flow outside District's Irrigation District Boundary. In order to demonstrate and ensure compliance with this Section 17.6, City shall install and maintain meters to monitor flow and usage at appropriate locations on its water delivery systems to determine (i) the amount of all Other City Water delivered to the Service Area, and (ii) the amount of all water (whether Treated Water or Other City Water) transported outside District's Irrigation District Boundary. City shall monitor these records to ensure that the amount recorded under (i) is at all times greater than or equal to the



amount recorded under (ii). City shall maintain records as to the items set forth above in this Section 17.6 which records shall be open to reasonable inspection by District, and its officers, directors, officials, employees, agents, and volunteers. A monthly summary of the applicable records shall be provided to District by City .

17.7. Conjunctive Use. It is understood by the Parties that from time to time water allocations for a Domestic Water Year to City may be reduced below 33,602.1 acre feet by the application of the formula set forth in Section 17.2. Accordingly, City shall exert its best efforts to maintain, in its judgment, reasonable groundwater pumping capacity to meet the needs of its Service Area during times of reduced surface water allocations. City's obligation to maintain reasonable groundwater pumping capacity shall be subject to the constraints of the groundwater basin underlying City as described in the Urban Water Management Plan and other City records, and City's obligation shall be subject to what is feasible and cost-effective.

## 18. PROJECT MANAGEMENT.

### 18.1. District's Board of Directors.

18.1.1. Final Decisions. Subject to the Approvals set forth in Section 18.3 and Section 18.5 and subject to the review set forth in Section 18.5 and Section 18.6, the Board shall be the final decision making authority with regard to the Project. The Board shall consider the recommendations of the Project Manager. All Board decisions shall be made at duly noticed regular meetings or special meetings.

18.1.2. Project Manager. The Board shall appoint a Project Manager, who shall perform those duties set forth in Section 18.2.

### 18.2. Duties of Project Manager.

18.2.1. Implementation of this Agreement. The responsibility for implementing and administering this Agreement and for carrying out the tasks necessary for the successful completion of each of the Phases of the First Expansion Facilities shall be vested in the Project Manager.

18.2.2. Notice to Advisory Committees. The Project Manager, in the course of fulfilling his responsibilities, shall provide the Advisory Committees reasonable advance notice of impending major decisions as defined in Section 18.6.1.C.

18.2.3. Specific Duties. The Project Manager shall have the following powers, duties, and responsibilities:

18.2.3.A. Work Plans. Developing a work plan for each Phase of the Project.

18.2.3.B. Progress Reports. Submitting periodic progress reports to the Parties and to the Board.

18.2.3.C. Administering Contracts. Administering this Agreement and any contracts as are entered into pursuant to this Agreement.

18.2.3.D. Public Information. Serving as public information officer for the Project.

18.2.3.E. Recommending Consultants. Recommending the hiring or utilization of consultants, engineers, contractors, attorneys, underwriters, and other services necessary to carry out the Project.

18.2.3.F. Financial Report. Preparing an annual financial report within three months of the end of each Year of the operation of the Project for review by the Advisory Committees. The annual financial report shall include the amount of water delivered by District to its agricultural customers and to City during the preceding Year. To the extent permitted by data available at the time of preparation of the report, the report shall also include estimates of the amount of water which will be available during the current Year for delivery to the agricultural water users of District and to City. In the event that during the Year changed water conditions modify the projections of the availability of water to District's customers, the Project Manager shall promptly notify the Advisory Committees.

18.2.3.G. Emergency Plans. Developing emergency plans for dealing with reasonably anticipated events of force majeure so as to minimize, to the extent practical, the interruption or curtailment of the operation of the Project and, to the extent practical, ensure the continued delivery of Treated Water to City.

18.2.3.H. Other Duties. Other duties as are necessary and proper to carry out the Project.

18.3. City Approval of First Expansion Facilities Milestones. Since City will be paying virtually all costs associated with design, construction, operation, maintenance, repair, reconstruction, and Modifications of and to the First Expansion Facilities, the Parties agree and consent that City shall have the authority to approve or disapprove major First Expansion Facilities milestones as follows:

18.3.1. Engineering Services. Prior to District's approval of any engineering services contract concerning the design and engineering of the First Expansion Facilities, City shall review the contract or contracts and each shall provide District with written authorization to proceed.

18.3.2. Review of Preliminary Design. Prior to proceeding with the final Design Phase under an engineering services contract, City shall review the preliminary design plans and preliminary cost estimate and each shall provide District with its written authorization to proceed.

18.3.3. Acceptance of Final Design. Prior to accepting the final design work, including construction ready final plans and specifications and final cost estimate, City shall review the final design work and cost estimate and shall provide District with its written authorization to proceed.

18.3.4. Construction Contracts. Prior to District's approval of a construction contract or contracts for the construction of the First Expansion Facilities, City shall review the construction contract documents and shall provide District with its written authorization to proceed.

18.4. Processing Milestone Approvals. City shall act promptly in giving or refusing to give any of the written authorizations to proceed as set forth above. The written authorizations to proceed to be given by City shall not be unreasonably withheld. If City fails to provide its written authorization to proceed, or written refusal of authorization, within 45 days from the date of the written request for authorization from District, then City shall be deemed to have authorized District to proceed with the milestone in question. If City refuses to authorize any of the foregoing Project milestones, it shall set forth in writing its reason or reasons for the refusal and shall timely provide the writing to the other Party. Thereafter either (i) District shall work to address and resolve City's concerns and then re-request the written authorization to proceed for the particular Project milestone, or (ii) either Party may terminate the First Expansion Facilities pursuant to Section 22.2.

18.5. Project Financing Approvals. Prior to issuing bonds or other evidences of indebtedness or certificates of participation for the purpose of Financing the First Expansion Facilities, District shall give written notice to City that the time to commence Financing has arrived. Within 30 days of the notice, the Finance Committee shall meet and confer at least once

and within 60 days of the notice City shall advise District in writing as to whether Fixed Financing or Variable Financing shall be used. If City advises in writing that Fixed Financing is to be used or fail to give their written advice within 60 days of the notice, the Fixed Financing shall be used.

18.5.1. Fixed Financing. If Fixed Financing is to be used, District shall give written notice to City that Fixed Financing is to be used and shall request that City give to District a not-to-exceed TIC within 30 days of the notice and request. Within 15 days of the notice and request by District, the Finance Committee shall meet at least once. Upon receipt of a not-to-exceed TIC from City, District shall thereafter be responsible for marketing the Financing subject to the not-to-exceed TIC approved by City. The members of the Finance Committee shall be present at the time and place of marketing and they and their financial advisers shall consult with the persons responsible for the marketing for District and the terms and conditions of the Financing, but all final decisions shall be made by District, provided that the TIC of the issue is (i) the lowest then available, and (ii) at or below the not-to-exceed TIC approved by City. In the event City fails to approve a not-to-exceed TIC within 30 days of the notice from District that Fixed Financing is to be used, then the Parties shall seek to reach agreement as to a not-to-exceed TIC or either Party may terminate the First Expansion Facilities pursuant to Section 22.2. It is understood that bond insurance shall be used with Fixed Financing if, when the cost of bond insurance premiums is included in Debt Service, the result is the lowest Fixed Financing alternative available at the time of Fixed Financing.

18.5.2. Variable Financing. Variable Financing shall be used only during the Construction Phase, except as otherwise provided herein. If City agrees that Variable Financing should be undertaken, District shall issue Variable Financing for the duration of the Construction Phase. No later than 60 days after the Commercial Operation Date, the Variable Financing shall be replaced entirely by Fixed Financing unless the Parties unanimously agree to the contrary. It is understood that Variable Financing may require the use of a letter of credit and, if that is the case, the cost of the letter of credit shall be financed out of the Variable Financing.

18.5.2.A. Initial Financing. Variable Financing shall initially be issued in the maturities and at the interest rates as, in the judgment of District after consulting with the Finance Committee, provides the most cost-effective combination of maturities and interest rates.

Thereafter, as the securities mature, District shall be solely responsible for the remarketing of the securities until the Issuance of the Fixed Financing.

18.5.2.B. Conversion During Construction Phase. If Variable Financing is issued for the First Expansion Facilities, City may, during the Construction Phase, request that District convert the Variable Financing to Fixed Financing. The request may be conditioned upon the ability of District to secure the Fixed Financing at a TIC specified in City's request.

18.5.2.C. Conversion Upon Commercial Operation. If no request to convert Variable Financing to Fixed Financing has been made prior to the Commercial Operation Date, District shall convert the Variable Financing to Fixed Financing on the Commercial Operation Date, or within 60 days thereafter without regard to the provisions of Section 18.5.1, provided, however, that District shall consult with the Finance Committee during the time it is converting the Variable Financing to Fixed Financing unless the Parties unanimously agree to the contrary.

18.6. Advisory Committees. In order to assist District and the Project Manager with the implementation of the Project, the following committees are formed and shall have the following duties, responsibilities, and authority:

18.6.1. Policy Committee. A Policy Committee consisting of two City Council members and two members of the Board. The Policy Committee shall meet at least twice each Year, and at other times when a meeting is called by the Project Manager. Each member of the Policy Committee shall serve at the pleasure of the Party selecting that member. The Policy Committee shall function during all three Phases, and shall have the following responsibilities and authority:

18.6.1.A. First Expansion Facilities Milestones. To review and make recommendations to City concerning the request for authorization to proceed with First Expansion Facilities milestones pursuant to Section 18.3. District and the Project Manager shall not request written authorization to proceed with any of the First Expansion Facilities milestones until after the Policy Committee has reviewed the proposal and made a recommendation to City.

18.6.1.B. Budget Functions. To perform the functions with respect to District budget for the Project as set forth in Section 18.7. All expenditures of District concerning the Project shall be consistent with the approved budget.

18.6.1.C. Major Decisions and Design Changes (In Excess of \$100,000).

To review and advise District and the Project Manager concerning major decisions or changes in the Project or design of the First Expansion Facilities. A major decision shall be defined as any contract, change order, purchase, change in policy, or any other action with an estimated cost in excess of \$100,000. A major change in the design of the First Expansion Facilities shall be defined as any change involving an estimated increase or decrease in the cost of the First Expansion Facilities in excess of \$100,000. A major decision shall not include any budgeted expenditure in a budget that has been approved pursuant to Section 18.7.

18.6.2. Technical Committee. A Technical Committee, consisting of one staff person appointed by each Party, and one alternate member as each Party deems necessary. Each member of the Technical Committee shall serve at the pleasure of the Party selecting that member. The Technical Committee shall meet at least once each month, and at all other times as requested by the Project Manager. During the Construction Phase of the Project, the Technical Committee shall meet once a month. If additional meetings are required, any of the parties, with five days prior notice, may schedule a Technical Committee meeting. The Technical Committee shall function during all three Phases of the Project, and shall have the following responsibilities and authority:

18.6.2.A. Consultation With Project Manager. To advise and consult with the Project Manager and District, to exchange information, and to make any necessary recommendations relating to the Project design, construction, operation, and maintenance. The Project Manager shall, from time to time, inform the Technical Committee of any material event, incident, occurrence, or condition that the Project Manager anticipates may impair District's ability to perform its obligations under this Agreement, including, but not limited to, labor disputes and threatened or pending litigation.

18.6.2.B. Recommendations to Policy Committee. To review and make recommendations to the Policy Committee for all matters within the scope of authority and responsibility of the Policy Committee.

18.6.2.C. Advice Relative to Minor Decisions (\$5,000 to \$100,000). To review and advise the Project Manager concerning any minor decision affecting the Project. A minor decision shall be defined as any contract, change order, purchase, change in policy, or any other action with an estimated cost between \$5,000 and \$100,000, and any action involving

changes in Treated Water quality beyond the range of normal plant operation variability. A major decision shall not include any budgeted expenditure in a budget that has been approved pursuant to Section 18.7.

18.7. Budget.

18.7.1. Budget Principles. In preparing and reviewing budgets for the Project, the Parties shall be guided by the principle that the Project shall be operated in as economic a manner as practical in accordance with generally accepted waterworks practices as evidenced by well designed and operated similar sized potable water treatment plants in Northern California.

18.7.2. Budget Process.

18.7.2.A. Preparation. For each Year during the Commercial Operation Phase, District shall prepare a budget for the Project prior to December 31 for the next ensuing Year. All Project budgets shall include both operating and capital components and shall include a monthly payment to be paid during the next ensuing Domestic Water Year in accordance with Sections 14 and 15. Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), the budget shall be expanded to include the First Expansion Facilities costs and the increased Treated Water allocation of 67,204.2 acre-feet per year.

18.7.2.B. Technical Committee Review and Recommendation. Prior to completion of the first administrative draft of each Year's budget by District, the Project Manager shall meet with the Technical Committee at least once to discuss and receive input from the Committee concerning development of the budget. Prior to submission of the budget to the Policy Committee, the Technical Committee may make a recommendation with respect to the budget to the Policy Committee. Upon completion of the first administrative draft of a Year's budget and not later than September 15 of each Year, the Project Manager shall forthwith furnish it to the members of the Technical Committee. Within 15 days of receipt of the draft budget, the Technical Committee members may individually or collectively submit to the Project Manager their recommendations and/or comments regarding draft budget. The documents shall not be mailed to City as provided in Section 18.7.2.C until after the expiration of this 15 day Period.

18.7.2.C. Information to City. At least 10 days before the mailing of the annual budget to City as provided in this Section 18.7.2.C, the Project Manager shall mail copies of the budget to the Technical Committee and during the 10 day Period the Project Manager shall arrange at least one meeting of the Technical Committee for review of the budget. After the

expiration of the above 10 day Period and at least 20 days before the submission of each annual budget to District Board, the Project Manager shall mail to City copies of the proposed budget for the ensuing Year and a detailed calculation of the proposed monthly payment obligations of City for the ensuing Domestic Water Year calculated pursuant to Section 15.3 of this Agreement. Commencing after the first Year of operation, the Project Manager shall also at the same time mail copies of the most recent update of the current Year's expenditures and revenues, and the balance sheet and income statement for the most recent Year, if available.

18.7.2.D. Policy Committee Review. Approximately 10 days before the submission of the budget to District Board, the Policy Committee shall meet to review and discuss the proposed budget for the ensuing Year. District staff at this meeting shall explain and justify the need for all of the various budget items and proposed expenditures. At this meeting, the Parties shall strive to agree upon a budget for the ensuing Year.

18.7.2.E. Consideration of Budget by Policy Committee. The budget shall be deemed approved by the Policy Committee unless, at the meeting, the Committee by an affirmative vote of at least two members of the Committee objects to one or more of the budget items. If the Policy Committee objects to one or more budget items, the Committee members objecting shall specify the item or items of the budget which are objectionable, and why the item or items are objectionable.

18.7.2.F. Revision of Budget, Alternate Budget and Report. If one or more budget items are objected to by the Policy Committee, District shall either (i) revise the budget at the Policy Committee meeting so that it is acceptable to at least three members of the Policy Committee, (ii) continue the Policy Committee meeting and thereafter consider the objections raised at the meeting and prepare a revised budget for consideration by the Policy Committee at a subsequent meeting, or (iii) District may determine to submit the budget to District Board over the objections of the Policy Committee. In the latter event, District shall give written notice to the Policy Committee, and the Policy Committee may, within 10 days after receipt of this notice, submit an alternative to the objectionable budget item or items to District Board to be considered along with the budget submitted by District. The alternative budget item or items shall be accompanied report as to the reasons the alternate budget should be adopted in place of the budget submitted by District.



18.7.3 Public Hearing. The annual budget for the Project shall be adopted by the Board only after a public hearing for which ten days' notice has been given by publication in a newspaper of general circulation published and circulated within District. The period of notice commences on the first day of publication and terminates on the 10th day following, including the day of publication.

18.7.4. Appearance at Hearing. The foregoing provisions on review concerning the budget are not intended to, and shall not, preclude City, and its officers, , officials, employees, agents, and volunteers, from appearing before District Board regarding the proposed budget.

18.7.5. Increase. If, during the course of any Year, District proposes to make any budget increase, then the provisions of Sections 18.7.1 through 18.7.2.F concerning review of budgets shall apply to the budget increase.

19. LIABILITY AND INSURANCE.

19.1. Insurance, General. During all Phases of the Project, District shall procure and maintain Project Insurance, including coverage for the construction, operation, and maintenance of the Project, and all operation and activities concerning all Phases of the Project. Such Project insurance coverage shall be primary insurance coverage for all claims related to this Project and City shall be named as an additional insured. Any insurance or self insurance maintained by City, District or their respective directors, officers, officials, employees, agents or volunteers shall be excess of the Project insurance and shall not contribute with it.

19.1.1. Project General Liability. Project General Liability insurance in an amount not less than \$1,000,000 per occurrence, combined single limit for bodily injury and property damage, \$3,000,000 aggregate.

19.1.2. Commercial Automobile Liability Insurance. Commercial Automobile Liability insurance including, as applicable, owned, non-owned and hired automobiles, in an amount not less than \$1,000,000 per occurrence combined single limit for bodily injury and property damage.

19.1.3. Umbrella or Excess Liability Insurance. Umbrella or Excess Liability insurance in an amount not less than \$10,000,000 over and above the underlying limits with the Umbrella or Excess Liability policy containing insuring agreements, exclusions and conditions of coverage substantially similar to the underlying policies.

19.1.4. Workers' Compensation Insurance. Workers' Compensation Insurance as required by the State of California, including employer's liability limits of not less than \$1,000,000 per accident. All rights of subrogation against City, its officers, elected officials, officials, employees, and volunteers shall be waived by the insurer for losses arising from work performed by District. All costs for the waiver of subrogation shall be borne by the Project.

19.1.5 Property Insurance.

19.1.5.A. Course of Construction Insurance. District shall maintain this coverage in its insurance policy portfolio protecting the First Expansion Facilities.

19.1.5.B. Buildings and Equipment Insurance. Special form (all risks subject to approved exclusions) insurance for the Project shall be placed on a replacement cost basis, including the agreed amount or comparable endorsement, all buildings and structures comprising the Project and all fixtures, equipment, and facilities located in, on, or connected with the Project, excluding the pipeline and its associated equipment and fixtures. Such insurance shall include coverage for loss of use, loss of rents, or loss of financing payment. Loss payee under this policy mentioned in this Section 19.1.5.B shall be determined by the Financing documents.

19.1.6. Insurance Provisions. Each insurance policy required by this Agreement shall contain the following clauses:

19.1.6.A. Cancellation. This insurance shall not be cancelled, limited in scope or coverage or non-renewed until 30 days after prior written notice has been given to District and City. Upon receipt of a notice of cancellation of non-payment, District shall give City immediate notice of non-payment of any insurance policy premium required to maintain the insurance coverage required by this Agreement.

19.1.6.B. City to be Named. On all policies, City and its officers, elected officials, officials, employees, agents, and volunteers are to be covered as additional insureds as respects to claims or losses arising out of activities related to the Project. This additional insured requirement shall not apply to Workers' Compensation Insurance.

19.1.6.C. Special Limitations. No policy shall contain any special limitation as to the scope of protection afforded City or its officers, elected officials, officials, elected officials, employees, agents, and volunteers.

19.1.6.D. Approval by City. The policies of insurance required by this Agreement shall be issued by an insurer, or insurers, and shall be in a form approved by City, which approval shall not be unreasonably withheld. Any deductible, and/or self insured retention must be declared to City. District and City shall meet annually to review Project insurance and, if changes are necessary, make recommendations to the Technical Committee.

19.1.7. Insurance Provision in All Contracts. In any and all contracts entered into concerning the construction, operation, or maintenance of the Project, District shall include a provision requiring that the contractor and all of its subcontractors provide insurance protection in an amount agreed by City and District.

19.2. Indemnification and Hold Harmless.

19.2.1. Indemnification by District. Except as provided in Sections 19.3 through 19.6, District shall indemnify, defend, protect, and hold harmless City, and its officers, elected officials, officials, employees, agents, and volunteers from any and all liabilities, claims, damages, losses, judgments, penalties, costs, or expenses (including attorneys' fees) arising out of or relating to the performance of the Project caused in whole or in part by any negligent act or omission of District or contractors, any subcontractors, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except where caused by the active negligence, sole negligence, or willful misconduct of City, its officers, officials, elected officials, employees and volunteers.

19.2.2. Cost of Litigation. Subject to the other provisions of this Agreement, the reasonable cost of the prosecution and defense of litigation and the payment of settlements or judgments in connection with litigation necessary to perform, or arising from, the construction, financing, operation, or maintenance of the Project by District shall be a cost of the Project.

19.2.3. Notification. District shall advise City in writing promptly as to any litigation the cost of which, including settlements or judgments, District proposes be a cost of the Project.

19.2.4. Objections. If City raises any objection in writing within 10 days of notification pursuant to Section 19.2.3 as to the cost of litigation being a cost of the Project, then the matter shall be subject to review by the Parties. In the event that City takes the position that the cost of particular litigation should not be an expense to be passed on to the Project or that only a portion of the cost of particular litigation should be an expense to be passed on to the

Project, then City Attorney, and the General Counsel of District shall meet and endeavor to reach an agreement relative to the sharing of the costs related to the particular litigation. If the attorneys are unable to promptly come to an agreement, the issue shall be submitted to the Chief Executive Officers. If the Chief Executive Officers are unable to promptly come to an agreement, the Parties shall promptly agree upon an independent attorney or retired judge to determine the matter. If the Parties cannot, within thirty (30) days of the dispute first arising, agree upon a decision relative to the dispute or an independent attorney or retired judge to determine the matter, any Party may request the American Arbitration Association to appoint an independent attorney or retired judge. For purposes of calculating the foregoing 30 day period, the dispute shall be deemed to have arisen on the day City gave notice to District of an objection pursuant to this Section 19.2.4. Upon appointment, the independent attorney or retired judge shall promptly decide the dispute based upon whether the litigation involved is necessary to perform, or arises from, the construction, financing, operation, or maintenance of the Project by District.

19.3. Third Party Claims Not Covered by Insurance; Willful. With respect to claims and lawsuits against one or more of the Parties by third parties concerning injury, death, property damage, or construction claims resulting from the construction, operation or maintenance of the Project, which claims and lawsuits are not covered by insurance, including self insurance, maintained by District pursuant to Section 19.1, and which are the result of willful misconduct, intentional tort, or gross negligence of one of the Parties, the Party whose willful misconduct, intentional tort, or gross negligence resulted in the damage claimed by the third party shall indemnify, defend, protect, and hold harmless the other Party, and its respective officers, elected officials, officials, employees, agents, and volunteers from any and all liabilities, claims, damages, losses, judgments, penalties, costs, or expenses (including attorneys' fees) resulting from a claim or lawsuit by a third party. This Section 19.3 shall not apply if the lack of insurance coverage is because of a denial of coverage based on District's failure to comply with any claim reporting requirement of any applicable insurance.

19.4. Third Party Claims Not Covered by Insurance; Ordinary. With respect to claims and lawsuits against one or more of the Parties by third parties concerning injury, death, or property damage resulting from the construction, operation or maintenance of the Project, which claims and lawsuits are not covered by insurance, including self insurance, maintained by

District pursuant to Section 19.1, and which are not the result of willful misconduct, intentional tort, or gross negligence of one of the Parties, District shall defend the claim or lawsuit on behalf of either or both of the Parties to this Agreement which are named in the claim or lawsuit, and District shall pay any settlement entered into by District or judgment entered against District or City. City shall reimburse District for its defense costs (including attorneys' fees and litigation expenses), settlement and judgment amounts incurred pursuant to this provision, in accordance with their respective percentage obligations to reimburse all Project costs pursuant to this Agreement, provided, however, that City shall not be obligated to pay any settlement of any Project related claim unless City approves the settlement. This Section 19.4 shall not apply if the lack of insurance coverage is because of a denial of coverage based upon District's failure to comply with any claim reporting requirement of any applicable insurance.

19.5. Claims Between Parties. With respect to claims and lawsuits by one of the Parties against the other, the claims and lawsuits shall be processed and resolved in accordance with (i) the Tort Claims Act and/or (ii) breach of contract remedies provided by this Agreement, or applicable law. Nothing in this Agreement shall relieve either Party of any contractual liability or duty imposed by this Agreement.

19.6. Workers' Compensation Claims. Each Party shall bear the costs of discharging all liability imposed, including costs and expenses for attorneys' fees and other costs of defending, settling, or otherwise administering claims arising out of workers' compensation or employers liability claims brought by its employees.

19.7. Replacement of Pro Rata Right of Contribution. The insurance, indemnification, hold harmless, and reimbursement provisions set forth above in Sections 19.1 through 19.4 are intended to and shall replace, and be applicable instead of, the pro rata right of contribution provisions of Government Code Section 895.6, to the extent that Section is applicable.

19.8. Defense by Modesto City Attorney. For any claim or lawsuit against City (whether or not also against District) which falls under Section 19.4, City may defend its own interests through its City Attorney's office; provided, however, that if District is also named in the claim or lawsuit, defense of District by the Modesto City Attorney shall only be with the consent of District, which consent shall not be unreasonably withheld. City shall bear all costs and expenses in representing its own interests pursuant to this Section 19.8. If the Modesto City Attorney represents both parties, then its costs and expenses shall be divided equally among the

Parties to the claim or lawsuit. If City decides not to represent its own interests pursuant to this Section 19.8 , then District shall defend the claim or lawsuit on behalf of City pursuant to Section 19.4.

20. RELATIONSHIP OF PARTIES.

Except as provided in Section 19, the covenants, obligations, and liabilities of the Parties are intended to be several and not joint or collective, and nothing herein contained shall ever be construed to create an association, joint venture, trust, or partnership, or to impose a trust or partnership covenant, obligation, or liability on or with regard to one or both of the Parties. Each Party shall be individually responsible for its own covenants, obligations, and liabilities pursuant to this Agreement. No Party shall be under the control of or shall be deemed to control any other Party or the Parties as a group. No Party shall be the agent of or have a right or power to bind any other Party without its express prior written consent, except as expressly provided in this Agreement.

21. GENERAL PROVISIONS GOVERNING AGREEMENT.

21.1. Severance. In the event that any of the terms, covenants or conditions of this Agreement or the application of any term, covenant or condition shall be held invalid as to any Party or circumstance by any court having jurisdiction over the Parties or subject matter of this Agreement, all other terms, covenants or conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect unless a court holds that the provisions are not separable from all other provisions of this Agreement.

21.2 Waiver. The waiver at any time by any Party of its rights with respect to a default or other matter arising in connection with this Agreement shall not be deemed a waiver with respect to any subsequent default or matter.

21.3. Counterparts. This Agreement may be executed in counterparts.

21.4. Supporting Resolutions. Each Party represents that it has legal authority to enter into this Agreement and to perform its obligations hereunder, and shall attach to this Agreement a duly authorized resolution evidencing the authority and authorizing the person executing this Agreement to do so.

21.5. No Rights in Other Parties. This Agreement is for the sole benefit of the Parties and shall not be construed as granting rights to any person other than the Parties or, except as

specifically set forth in this Agreement, imputing to any person the obligations imposed on a Party.

21.6. Amendment. This Agreement may be amended only by a written instrument duly executed by both of the Parties hereto.

21.7. Obligations Prior to Termination. The obligations of the Parties incurred pursuant to this Agreement prior to Termination of this Agreement shall survive the Termination.

21.8. Captions. The captions and the headings in this Agreement are inserted merely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and provisions hereof.

21.9. Additional Documents. Each Party agrees to make, execute, and deliver any and all documents reasonably required to implement this Agreement.

21.10. Governing Law. This Agreement shall be interpreted, governed by, and construed under the laws of the State of California.

21.11. Shall and May. “Shall” is mandatory and “may” is permissive.

21.12. Non-Discrimination. In performing the obligations of this Agreement, there shall be no discrimination against any employee or applicant for employment because of race, color, religion, sex, or national origin.

## 22. TERM AND TERMINATION.

22.1. Execution by Both Parties. This Agreement shall not become effective until it has been executed by both Parties. Following execution by both Parties, this Agreement shall continue in effect until the earlier of the following:

22.1.1. Superseded by Other Agreement. This Agreement is superseded by another, or an amended, agreement which, by its terms, supersedes this Agreement.

22.1.2. Termination by Mutual Agreement. Termination by mutual agreement of the Parties.

22.2. Termination of Participation in First Expansion Facilities Prior to Financing. Notwithstanding any other provision in this Agreement to the contrary, either Party, prior to the time District issues either Variable Financing or Fixed Financing, whichever occurs first, for the purpose of Financing the First Expansion Facilities, upon not less than 30 days' written notice to the other Party, shall be entitled to terminate its participation in the First Expansion Facilities at any time (i) the Party determines that the First Expansion Facilities is not feasible because of

technical, engineering, or economic reasons, or if adequate insurance is not, or probably will not, be available at a commercially reasonable price, or for other reasons as would cause a reasonably prudent utility in the same or similar circumstances to terminate its participation in a First Expansion Facilities as is contemplated by this Agreement (failure of District to permanently secure a permit to divert sufficient water for urban purposes to meet its obligations under this agreement shall be such cause for termination), or (ii) City determines that District has failed to meet its Design Phase or, if Financing has not yet been obtained, its Construction Phase obligations, and has failed to pursue those obligations with due diligence. If the First Expansion Facilities is terminated pursuant to the provision, then this Agreement shall remain in effect as to the Initial Facilities.

23. UNDERTAKINGS. [Not Used]

24. WATER RIGHTS AND OWNERSHIP.

City shall not own or acquire any of District's water rights, but shall have an absolute right to the delivery of Treated Water in accordance with the terms of this Agreement. City shall not have any ownership rights in any of the facilities of the Project except as specified in this agreement. District shall use its best efforts to exercise and utilize all of its available water rights and supplies to ensure that it delivers the full allocation of Treated Water to City to the extent feasible. District, though, retains the discretion and flexibility to exercise its water rights in such a manner as to reasonably and prudently manage and plan for single and multiple-year Droughts. District also agrees to vigorously defend its water rights and oppose any litigation or regulatory proceeding that could adversely impact District's ability to provide the full allocation of Treated Water to City.

24.1. The parties contemplate that City may increase its reclamation of waste water from its primary or secondary wastewater treatment plants by additional advanced treatment/ technologies and/or methods for groundwater recharge, resale, or any other use whatsoever, inside or outside District's irrigation district boundary. District agrees that City has the right to utilize its reclaimed water in this manner, and shall not object to any such reclaimed water usage, transportation or sale to any, court, administrative agency or other body or tribunal with jurisdiction over any such use, or in the press.



24.2. Nothing in the agreement shall restrict, prohibit, or inhibit in any way, City's right to acquire from third parties and/or exercise water rights additional to or apart from those enumerated in this agreement.

25. NOTICES.

Any notice, demand, or request provided for in this Agreement shall be in writing, and shall be deemed properly served, given, or made if delivered in person or if sent by registered or certified mail, postage prepaid, to the persons specified below:

District:       General Manager  
                  Modesto Irrigation District  
                  Post Office Box 4060  
                  Modesto, CA 95352

City:            City Manager  
                  City of Modesto  
                  Post Office Box 642  
                  Modesto, CA 95353

MODESTO IRRIGATION DISTRICT

CITY OF MODESTO

By: \_\_\_\_\_  
      President

By: \_\_\_\_\_  
      Mayor

\_\_\_\_\_  
Vice President

\_\_\_\_\_  
City Manager

Approved as to form:

Approved as to form:

\_\_\_\_\_  
General Counsel

\_\_\_\_\_  
City Attorney

Attest:

Attest:

\_\_\_\_\_  
Secretary

\_\_\_\_\_  
City Clerk

## **EXHIBIT A – MID SUNK COSTS**

(Through October 1, 2005)

Consultants = \$982,773.00

Kind Labor = \$501,580.46

Materials & Supplies = \$18,558.08

Advertising = \$9,271.65

Meals & Lodging = \$2,701.07

Transportation = \$2,666.26

Miscellaneous = \$940.73

Meetings = \$ 875

**TOTAL = \$1,519,366.25\***

\*Detailed accounts, reported by date and expenditure type, are included on the attached spreadsheets.

PHASE TWO DOMESTIC WATER EXPANSION PROJECT-COSTS FRONTED BY MID  
EXPENDITURES THROUGH MAY 28, 2005

| Line | Project No. | Task | Employee/Supplier         | Expnd Type  | Item Date | Quantity | UOM   | Burdened Cost | Comment | Expnd Org              |
|------|-------------|------|---------------------------|-------------|-----------|----------|-------|---------------|---------|------------------------|
| 1    | 701620      | 1.0  | COLBY, DAVID W (DAVE)     |             | 08-Jan-05 | 12       | Hours | \$640.00      |         | 8420-Civil Engineering |
| 2    | 701620      | 1.0  | COLBY, DAVID W (DAVE)     |             | 22-Jan-05 | 12       | Hours | \$640.00      |         | 8420-Civil Engineering |
| 3    | 701620      | 1.0  | COLBY, DAVID W (DAVE)     |             | 05-Feb-05 | 4        | Hours | \$213.33      |         | 8420-Civil Engineering |
| 4    | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) | Total Labor | 22-Sep-01 | 1        | Hours | \$1,483.33    |         | 8420-Civil Engineering |
| 5    | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 06-Oct-01 | 48       | Hours | \$1,242.13    |         | 8420-Civil Engineering |
| 6    | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 17-Nov-01 | 50       | Hours | \$2,981.12    |         | 8420-Civil Engineering |
| 7    | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 20-Dec-01 | 24       | Hours | \$3,105.34    |         | 8420-Civil Engineering |
| 8    | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 01-Jan-02 | 40       | Hours | \$1,490.56    |         | 8420-Civil Engineering |
| 9    | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 15-Dec-01 | 40       | Hours | \$2,584.12    |         | 8420-Civil Engineering |
| 10   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 29-Dec-01 | 44.5     | Hours | \$2,874.85    |         | 8420-Civil Engineering |
| 11   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 12-Jan-02 | 60       | Hours | \$3,876.19    |         | 8420-Civil Engineering |
| 12   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 26-Jan-02 | 45       | Hours | \$2,907.14    |         | 8420-Civil Engineering |
| 13   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 09-Feb-02 | 46       | Hours | \$2,971.74    |         | 8420-Civil Engineering |
| 14   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 23-Feb-02 | 51       | Hours | \$3,284.76    |         | 8420-Civil Engineering |
| 15   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 09-Mar-02 | 56.25    | Hours | \$3,763.13    |         | 8420-Civil Engineering |
| 16   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 23-Mar-02 | 25       | Hours | \$387.62      |         | 8420-Civil Engineering |
| 17   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 06-Apr-02 | 25.5     | Hours | \$1,615.08    |         | 8420-Civil Engineering |
| 18   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 20-Apr-02 | 45       | Hours | \$1,647.39    |         | 8420-Civil Engineering |
| 19   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 04-May-02 | 44       | Hours | \$2,907.14    |         | 8420-Civil Engineering |
| 20   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 18-May-02 | 40       | Hours | \$2,842.54    |         | 8420-Civil Engineering |
| 21   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 01-Jun-02 | 38       | Hours | \$2,584.12    |         | 8420-Civil Engineering |
| 22   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 15-Jun-02 | 44       | Hours | \$2,454.92    |         | 8420-Civil Engineering |
| 23   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 29-Jun-02 | 43       | Hours | \$2,842.54    |         | 8420-Civil Engineering |
| 24   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 13-Jul-02 | 39       | Hours | \$2,777.93    |         | 8420-Civil Engineering |
| 25   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 25-Jan-03 | 16       | Hours | \$1,099.56    |         | 8420-Civil Engineering |
| 26   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 08-Feb-03 | 24       | Hours | \$687.23      |         | 8420-Civil Engineering |
| 27   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 22-Feb-03 | 20       | Hours | \$1,649.34    |         | 8420-Civil Engineering |
| 28   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 08-Mar-03 | 15       | Hours | \$1,374.45    |         | 8420-Civil Engineering |
| 29   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 22-Mar-03 | 20       | Hours | \$1,124.42    |         | 8420-Civil Engineering |
| 30   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 05-Apr-03 | 21       | Hours | \$1,499.23    |         | 8420-Civil Engineering |
| 31   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 19-Apr-03 | 30       | Hours | \$1,574.19    |         | 8420-Civil Engineering |
| 32   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 03-May-03 | 25       | Hours | \$2,248.85    |         | 8420-Civil Engineering |
| 33   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 17-May-03 | 26       | Hours | \$1,874.04    |         | 8420-Civil Engineering |
| 34   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 31-May-03 | 20       | Hours | \$1,949.00    |         | 8420-Civil Engineering |
| 35   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 14-Jun-03 | 48       | Hours | \$1,499.23    |         | 8420-Civil Engineering |
| 36   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 28-Jun-03 | 12       | Hours | \$3,598.16    |         | 8420-Civil Engineering |
| 37   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 12-Jul-03 | 22       | Hours | \$899.54      |         | 8420-Civil Engineering |
| 38   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 26-Jul-03 | 2        | Hours | \$1,854.02    |         | 8420-Civil Engineering |
| 39   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 09-Aug-03 | 12       | Hours | \$168.55      |         | 8420-Civil Engineering |
| 40   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 06-Sep-03 | 22       | Hours | \$1,011.28    |         | 8420-Civil Engineering |
| 41   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 20-Sep-03 | 18       | Hours | \$1,854.02    |         | 8420-Civil Engineering |
| 42   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 04-Oct-03 | 25       | Hours | \$1,516.92    |         | 8420-Civil Engineering |
| 43   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 18-Oct-03 | 32       | Hours | \$2,106.84    |         | 8420-Civil Engineering |
| 44   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 01-Nov-03 | 33       | Hours | \$2,696.76    |         | 8420-Civil Engineering |
| 45   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 15-Nov-03 | 40       | Hours | \$2,781.03    |         | 8420-Civil Engineering |
| 46   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 29-Nov-03 | 17       | Hours | \$3,370.94    |         | 8420-Civil Engineering |
| 47   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 13-Dec-03 | 20       | Hours | \$1,432.65    |         | 8420-Civil Engineering |
| 48   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 27-Dec-03 | 19       | Hours | \$1,744.48    |         | 8420-Civil Engineering |
| 49   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 10-Jan-04 | 38       | Hours | \$3,028.84    |         | 8420-Civil Engineering |
| 50   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 24-Jan-04 | 43       | Hours | \$3,657.25    |         | 8420-Civil Engineering |
| 51   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 07-Feb-04 | 61.5     | Hours | \$3,427.37    |         | 8420-Civil Engineering |
| 52   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 21-Feb-04 | 50.5     | Hours | \$4,887.12    |         | 8420-Civil Engineering |
| 53   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 06-Mar-04 | 60.5     | Hours | \$4,013.01    |         | 8420-Civil Engineering |
| 54   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 20-Mar-04 | 58.5     | Hours | \$4,828.07    |         | 8420-Civil Engineering |
| 55   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 03-Apr-04 | 55       | Hours | \$4,668.46    |         | 8420-Civil Engineering |
| 56   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 17-Apr-04 | 32       | Hours | \$4,389.15    |         | 8420-Civil Engineering |
| 57   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 01-May-04 | 59       | Hours | \$2,553.68    |         | 8420-Civil Engineering |
| 58   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 15-May-04 | 38.5     | Hours | \$4,708.36    |         | 8420-Civil Engineering |
| 59   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 29-May-04 | 44       | Hours | \$3,072.41    |         | 8420-Civil Engineering |
| 60   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 12-Jun-04 | 20       | Hours | \$3,511.32    |         | 8420-Civil Engineering |
| 61   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 26-Jun-04 | 20       | Hours | \$1,596.05    |         | 8420-Civil Engineering |
| 62   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 10-Jul-04 | 24       | Hours | \$1,915.26    |         | 8420-Civil Engineering |
| 63   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 24-Jul-04 | 28       | Hours | \$2,234.47    |         | 8420-Civil Engineering |
| 64   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 07-Aug-04 | 40.5     | Hours | \$2,978.29    |         | 8420-Civil Engineering |
| 65   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 21-Aug-04 | 12       | Hours | \$862.46      |         | 8420-Civil Engineering |
| 66   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 04-Sep-04 | 38       | Hours | \$2,794.44    |         | 8420-Civil Engineering |
| 67   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 18-Sep-04 | 34       | Hours | \$2,794.44    |         | 8420-Civil Engineering |
| 68   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 02-Oct-04 | 34       | Hours | \$2,500.29    |         | 8420-Civil Engineering |
| 69   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 16-Oct-04 | 42       | Hours | \$3,088.59    |         | 8420-Civil Engineering |
| 70   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 30-Oct-04 | 52       | Hours | \$3,823.97    |         | 8420-Civil Engineering |
| 71   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 13-Nov-04 | 54       | Hours | \$3,971.05    |         | 8420-Civil Engineering |
| 72   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 27-Nov-04 | 36       | Hours | \$2,647.37    |         | 8420-Civil Engineering |
| 73   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 11-Dec-04 | 30       | Hours | \$2,206.14    |         | 8420-Civil Engineering |
| 74   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 25-Dec-04 | 41       | Hours | \$3,015.06    |         | 8420-Civil Engineering |
| 75   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 08-Jan-05 | 8        | Hours | \$588.30      |         | 8420-Civil Engineering |
| 76   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 22-Jan-05 | 25       | Hours | \$1,838.45    |         | 8420-Civil Engineering |
| 77   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 05-Feb-05 | 58       | Hours | \$4,118.12    |         | 8420-Civil Engineering |
| 78   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             | 19-Feb-05 | 43       | Hours | \$4,265.20    |         | 8420-Civil Engineering |
| 79   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             |           |          |       |               |         | 8420-Civil Engineering |
| 80   | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) |             |           |          |       |               |         | 8420-Civil Engineering |

| Line No. | Project | Task | Employee/Supplier               | Expend Type | Item Date | Quantity | UOM   | Burdened Cost       | Comment | Expend Org             |
|----------|---------|------|---------------------------------|-------------|-----------|----------|-------|---------------------|---------|------------------------|
| 81       | 701620  | 1.0  | DAS, GREGORY PAUL (GREG)        | 1           | 05-Mar-05 | 41       | Hours | \$3,015.06          |         | 8420-Civil Engineering |
| 82       | 701620  | 1.0  | DAS, GREGORY PAUL (GREG)        | 1           | 19-Mar-05 | 47       | Hours | \$3,559.56          |         | 8420-Civil Engineering |
| 83       | 701620  | 1.0  | DAS, GREGORY PAUL (GREG)        | 1           | 02-Apr-05 | 52       | Hours | \$4,506.01          |         | 8420-Civil Engineering |
| 84       | 701620  | 1.0  | DAS, GREGORY PAUL (GREG)        | 1           | 16-Apr-05 | 62.5     | Hours | \$5,415.88          |         | 8420-Civil Engineering |
| 85       | 701620  | 1.0  | DAS, GREGORY PAUL (GREG)        | 1           | 30-Apr-05 | 62       | Hours | \$5,372.55          |         | 8420-Civil Engineering |
| 86       | 701620  | 1.0  | DAS, GREGORY PAUL (GREG)        | 1           | 14-May-05 | 52       | Hours | \$5,099.58          |         | 8420-Civil Engineering |
| 87       | 701620  | 1.0  | DAS, GREGORY PAUL (GREG)        | 1           | 28-May-05 | 28       | Hours |                     |         | 8420-Civil Engineering |
|          |         |      | <b>Total Labor</b>              |             |           |          |       | <b>\$220,399.49</b> |         |                        |
| 88       | 701620  | 1.0  | DOMECO, ALLEN ROSS (ALLEN)      | 1           | 27-Dec-03 | 5        | Hours | \$286.61            |         | 8220-Modesto Dom Water |
| 89       | 701620  | 1.0  | DURRER, CHARLES L (CHUCK)       | 1           | 27-Dec-03 | 4        | Hours | \$162.25            |         | 8220-Modesto Dom Water |
| 90       | 701620  | 1.0  | DURRER, CHARLES L (CHUCK)       | 1           | 10-Jan-04 | 20       | Hours | \$741.32            |         | 8220-Modesto Dom Water |
| 91       | 701620  | 1.0  | DURRER, CHARLES L (CHUCK)       | 1           | 24-Jan-04 | 10       | Hours | \$370.66            |         | 8220-Modesto Dom Water |
|          |         |      | <b>Total Labor</b>              |             |           |          |       | <b>\$1,274.23</b>   |         |                        |
| 92       | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 27-Dec-03 | 8        | Hours | \$647.84            |         | 8220-Modesto Dom Water |
| 93       | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 10-Jan-04 | 30       | Hours | \$2,220.00          |         | 8220-Modesto Dom Water |
| 94       | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 24-Jan-04 | 14       | Hours | \$1,036.00          |         | 8220-Modesto Dom Water |
| 95       | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 07-Feb-04 | 10       | Hours | \$737.76            |         | 8220-Modesto Dom Water |
| 96       | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 07-Feb-04 | 10       | Hours | \$737.76            |         | 8220-Modesto Dom Water |
| 97       | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 21-Feb-04 | 5        | Hours | \$368.88            |         | 8220-Modesto Dom Water |
| 98       | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 21-Feb-04 | 2        | Hours | \$147.55            |         | 8220-Modesto Dom Water |
| 99       | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 06-Mar-04 | 10       | Hours | \$740.89            |         | 8220-Modesto Dom Water |
| 100      | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 20-Mar-04 | 5        | Hours | \$370.45            |         | 8220-Modesto Dom Water |
| 101      | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 01-May-04 | 6        | Hours | \$444.54            |         | 8220-Modesto Dom Water |
| 102      | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 29-May-04 | 10       | Hours | \$592.72            |         | 8220-Modesto Dom Water |
| 103      | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 16-Oct-04 | 8        | Hours | \$546.19            |         | 8220-Modesto Dom Water |
| 104      | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 30-Oct-04 | 20       | Hours | \$1,365.46          |         | 8220-Modesto Dom Water |
| 105      | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 13-Nov-04 | 10       | Hours | \$682.73            |         | 8220-Modesto Dom Water |
| 106      | 701620  | 1.0  | EDWARDS, KENNETH W (KEN)        | 1           | 27-Dec-03 | 4        | Hours | \$170.50            |         | 8220-Modesto Dom Water |
|          |         |      | <b>Total Labor</b>              |             |           |          |       | <b>\$11,379.66</b>  |         |                        |
| 107      | 701620  | 1.0  | GUMM, DALE E (DALE)             | 1           | 27-Dec-03 | 4        | Hours | \$170.50            |         | 8220-Modesto Dom Water |
|          |         |      | <b>Total Labor</b>              |             |           |          |       | <b>\$170.50</b>     |         |                        |
| 108      | 701620  | 1.0  | HARMON, KATE C (KATE)           | 1           | 27-Dec-03 | 4        | Hours | \$170.50            |         | 8220-Modesto Dom Water |
|          |         |      | <b>Total Labor</b>              |             |           |          |       | <b>\$170.50</b>     |         |                        |
| 109      | 701620  | 1.0  | HAUGH, JEFFREY CARL (JEFF)      | 1           | 27-Dec-03 | 4        | Hours | \$229.29            |         | 8220-Modesto Dom Water |
|          |         |      | <b>Total Labor</b>              |             |           |          |       | <b>\$229.29</b>     |         |                        |
| 110      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 01-May-04 | 10       | Hours | \$608.08            |         | 8220-Modesto Dom Water |
| 111      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 15-May-04 | 20       | Hours | \$1,216.17          |         | 8220-Modesto Dom Water |
| 112      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 29-May-04 | 20       | Hours | \$1,216.17          |         | 8220-Modesto Dom Water |
| 113      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 12-Jun-04 | 12       | Hours | \$729.70            |         | 8220-Modesto Dom Water |
| 114      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 26-Jun-04 | 8        | Hours | \$466.47            |         | 8220-Modesto Dom Water |
| 115      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 10-Jul-04 | 8        | Hours | \$466.47            |         | 8220-Modesto Dom Water |
| 116      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 07-Aug-04 | 10       | Hours | \$560.35            |         | 8220-Modesto Dom Water |
| 117      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 21-Aug-04 | 10       | Hours | \$588.73            |         | 8220-Modesto Dom Water |
| 118      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 04-Sep-04 | 10       | Hours | \$588.73            |         | 8220-Modesto Dom Water |
| 119      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 18-Sep-04 | 10       | Hours | \$588.73            |         | 8220-Modesto Dom Water |
| 120      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 02-Oct-04 | 10       | Hours | \$588.73            |         | 8220-Modesto Dom Water |
| 121      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 16-Oct-04 | 10       | Hours | \$588.73            |         | 8220-Modesto Dom Water |
| 122      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 30-Oct-04 | 10       | Hours | \$588.73            |         | 8220-Modesto Dom Water |
| 123      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 13-Nov-04 | 10       | Hours | \$588.73            |         | 8220-Modesto Dom Water |
| 124      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 27-Nov-04 | 6        | Hours | \$353.24            |         | 8220-Modesto Dom Water |
| 125      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 11-Dec-04 | 5        | Hours | \$294.37            |         | 8220-Modesto Dom Water |
| 126      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 25-Dec-04 | 2        | Hours | \$117.75            |         | 8220-Modesto Dom Water |
| 127      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 08-Jan-05 | 8        | Hours | \$470.98            |         | 8220-Modesto Dom Water |
| 128      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 08-Jan-05 | 4        | Hours | \$235.49            |         | 8220-Modesto Dom Water |
| 129      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 22-Jan-05 | 4        | Hours | \$235.49            |         | 8220-Modesto Dom Water |
| 130      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 05-Feb-05 | 12       | Hours | \$706.48            |         | 8220-Modesto Dom Water |
| 131      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 19-Feb-05 | 16       | Hours | \$941.97            |         | 8220-Modesto Dom Water |
| 132      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 05-Mar-05 | 14       | Hours | \$824.22            |         | 8220-Modesto Dom Water |
| 133      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 19-Mar-05 | 8        | Hours | \$465.15            |         | 8220-Modesto Dom Water |
| 134      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 02-Apr-05 | 10       | Hours | \$693.86            |         | 8220-Modesto Dom Water |
| 135      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 16-Apr-05 | 10       | Hours | \$693.86            |         | 8220-Modesto Dom Water |
| 136      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 30-Apr-05 | 22       | Hours | \$1,526.49          |         | 8220-Modesto Dom Water |
| 137      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 14-May-05 | 10       | Hours | \$785.26            |         | 8220-Modesto Dom Water |
| 138      | 701620  | 1.0  | HIDAH, CLAUDIA LOUISE (CLAUDIA) | 1           | 28-May-05 | 10       | Hours |                     |         | 8220-Modesto Dom Water |
|          |         |      | <b>Total Labor</b>              |             |           |          |       | <b>\$17,789.13</b>  |         |                        |
| 139      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 22-Sep-01 | 8        | Hours | \$576.28            |         | 8420-Civil Engineering |
| 140      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 06-Oct-01 | 6        | Hours | \$432.21            |         | 8420-Civil Engineering |
| 141      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 20-Oct-01 | 8        | Hours | \$576.28            |         | 8420-Civil Engineering |
| 142      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 03-Nov-01 | 4        | Hours | \$268.14            |         | 8420-Civil Engineering |
| 143      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 17-Nov-01 | 4        | Hours | \$268.14            |         | 8420-Civil Engineering |
| 144      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 01-Dec-01 | 4        | Hours | \$268.14            |         | 8420-Civil Engineering |
| 145      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 12-Jan-02 | 10       | Hours | \$749.06            |         | 8420-Civil Engineering |
| 146      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 26-Jan-02 | 20       | Hours | \$1,498.12          |         | 8420-Civil Engineering |
| 147      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 09-Feb-02 | 14       | Hours | \$1,048.69          |         | 8420-Civil Engineering |
| 148      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 23-Feb-02 | 24       | Hours | \$1,797.75          |         | 8420-Civil Engineering |
| 149      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 09-Mar-02 | 4        | Hours | \$299.62            |         | 8420-Civil Engineering |
| 150      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 19-Oct-02 | 1        | Hours | \$76.62             |         | 8420-Civil Engineering |
| 151      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 25-Jan-03 | 2        | Hours | \$169.38            |         | 8420-Civil Engineering |
| 152      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 08-Feb-03 | 2        | Hours | \$169.38            |         | 8420-Civil Engineering |
| 153      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 05-Apr-03 | 2        | Hours | \$173.85            |         | 8420-Civil Engineering |
| 154      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 14-Jun-03 | 8        | Hours | \$695.39            |         | 8420-Civil Engineering |
| 155      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)      | 1           | 12-Jul-03 | 1        | Hours | \$97.72             |         | 8420-Civil Engineering |

| Line No. | Project | Task | Employee/Supplier             | Expend Type    | Item Date | Quantity | UOM         | Burdened Cost | Comment | Expend Org                              |
|----------|---------|------|-------------------------------|----------------|-----------|----------|-------------|---------------|---------|---|
| 156      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 09-Aug-03 | 2        | Hours       | \$195.44      |         | 8420-Civil Engineering                  |
| 157      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 18-Oct-03 | 4        | Hours       | \$390.89      |         | 8420-Civil Engineering                  |
| 158      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 01-Nov-03 | 4        | Hours       | \$390.89      |         | 8420-Civil Engineering                  |
| 159      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 15-Nov-03 | 4        | Hours       | \$390.89      |         | 8420-Civil Engineering                  |
| 160      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 29-Nov-03 | 4        | Hours       | \$390.89      |         | 8420-Civil Engineering                  |
| 161      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 15-May-04 | 6        | Hours       | \$585.22      |         | 8420-Civil Engineering                  |
| 162      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 29-May-04 | 2        | Hours       | \$185.07      |         | 8420-Civil Engineering                  |
| 163      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 26-Jun-04 | 6        | Hours       | \$565.22      |         | 8420-Civil Engineering                  |
| 164      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 10-Jul-04 | 4        | Hours       | \$370.15      |         | 8420-Civil Engineering                  |
| 165      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 07-Aug-04 | 4        | Hours       | \$341.09      |         | 8420-Civil Engineering                  |
| 166      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 21-Aug-04 | 6        | Hours       | \$511.64      |         | 8420-Civil Engineering                  |
| 167      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 04-Sep-04 | 4        | Hours       | \$341.09      |         | 8420-Civil Engineering                  |
| 168      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 18-Sep-04 | 6        | Hours       | \$511.64      |         | 8420-Civil Engineering                  |
| 169      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 02-Oct-04 | 12       | Hours       | \$1,023.27    |         | 8420-Civil Engineering                  |
| 170      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 16-Oct-04 | 8        | Hours       | \$682.18      |         | 8420-Civil Engineering                  |
| 171      | 701620  | 1.1  | KETSCHER, WILLIAM M (BILL)    | 1              | 30-Oct-04 | 10       | Hours       | \$852.73      |         | 8420-Civil Engineering                  |
| 172      | 701620  | 1.1  | KETSCHER, WILLIAM M (BILL)    | 1              | 13-Nov-04 | 10       | Hours       | \$852.73      |         | 8420-Civil Engineering                  |
| 173      | 701620  | 1.1  | KETSCHER, WILLIAM M (BILL)    | 1              | 27-Nov-04 | 2        | Hours       | \$170.55      |         | 8420-Civil Engineering                  |
| 174      | 701620  | 1.1  | KETSCHER, WILLIAM M (BILL)    | 1              | 11-Dec-04 | 6        | Hours       | \$511.64      |         | 8420-Civil Engineering                  |
| 175      | 701620  | 1.1  | KETSCHER, WILLIAM M (BILL)    | 1              | 25-Dec-04 | 8        | Hours       | \$682.18      |         | 8420-Civil Engineering                  |
| 176      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 08-Jan-05 | 30       | Hours       | \$2,358.19    |         | 8420-Civil Engineering                  |
| 177      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 22-Jan-05 | 24       | Hours       | \$2,048.55    |         | 8420-Civil Engineering                  |
| 178      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 05-Feb-05 | 24       | Hours       | \$2,048.55    |         | 8420-Civil Engineering                  |
| 179      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 19-Feb-05 | 8        | Hours       | \$682.18      |         | 8420-Civil Engineering                  |
| 180      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 05-Mar-05 | 8        | Hours       | \$682.18      |         | 8420-Civil Engineering                  |
| 181      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 19-Mar-05 | 8        | Hours       | \$702.69      |         | 8420-Civil Engineering                  |
| 182      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 02-Apr-05 | 16       | Hours       | \$1,608.00    |         | 8420-Civil Engineering                  |
| 183      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 16-Apr-05 | 16       | Hours       | \$1,608.00    |         | 8420-Civil Engineering                  |
| 184      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 30-Apr-05 | 10       | Hours       | \$1,005.00    |         | 8420-Civil Engineering                  |
| 185      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 14-May-05 | 24       | Hours       | \$2,729.73    |         | 8420-Civil Engineering                  |
| 186      | 701620  | 1.0  | KETSCHER, WILLIAM M (BILL)    | 1              | 28-May-05 | 10       | Hours       | \$226.92      |         | 8420-Civil Engineering                  |
| 187      | 701620  | 1.0  | LOSCHKE, CARRIE E (CARRIE)    | 1              | 27-Dec-03 | 5.3      | Hours       | \$226.92      |         | 8220-Modesto Dom Water                  |
| 188      | 701620  | 1.0  | MASON, JOSEPH EDWARD (JOE)    | Total Labor    |           |          | \$35,005.16 |               |         |   |
| 189      | 701620  | 1.0  | MASON, JOSEPH EDWARD (JOE)    | 1              | 27-Dec-03 | 4        | Hours       | \$183.61      |         | 8220-Modesto Dom Water                  |
| 190      | 701620  | 1.0  | MASON, JOSEPH EDWARD (JOE)    | 1              | 10-Jan-04 | 30       | Hours       | \$1,258.36    |         | 8220-Modesto Dom Water                  |
| 191      | 701620  | 1.0  | MICAL, WILLIAM ANDREW (ANDY)  | 1              | 24-Jan-04 | 10       | Hours       | \$419.45      |         | 8220-Modesto Dom Water                  |
| 192      | 701620  | 1.0  | MICAL, WILLIAM ANDREW (ANDY)  | 1              | 10-Jan-04 | 9        | Hours       | \$471.44      |         | 8220-Modesto Dom Water                  |
| 193      | 701620  | 1.0  | MICAL, WILLIAM ANDREW (ANDY)  | 1              | 24-Jan-04 | 1        | Hours       | \$52.38       |         | 8220-Modesto Dom Water                  |
| 194      | 701620  | 1.0  | MILLER, JEFFERY LEE (JEFF)    | Total Labor    |           |          | \$104.89    |               |         |   |
| 195      | 701620  | 1.0  | MILLER, JEFFERY LEE (JEFF)    | 1              | 10-Jan-04 | 5        | Hours       | \$269.04      |         | 8220-Modesto Dom Water                  |
| 196      | 701620  | 1.1  | MILLER, JEFFERY LEE (JEFF)    | 1              | 27-Jan-04 | 60       | Hours       | \$3,468.44    |         | 8220-Modesto Dom Water                  |
| 197      | 701620  | 1.1  | MILLER, JEFFERY LEE (JEFF)    | 1              | 07-Feb-04 | 34.5     | Hours       | \$1,988.33    |         | 8220-Modesto Dom Water                  |
| 198      | 701620  | 1.0  | MILLER, JEFFERY LEE (JEFF)    | 1              | 07-Feb-04 | 5        | Hours       | \$288.16      |         | 8220-Modesto Dom Water                  |
| 199      | 701620  | 1.1  | MILLER, JEFFERY LEE (JEFF)    | 1              | 06-Mar-04 | 10       | Hours       | \$578.77      |         | 8220-Modesto Dom Water                  |
| 200      | 701620  | 1.0  | MILLER, JEFFERY LEE (JEFF)    | 1              | 29-May-04 | 10       | Hours       | \$578.77      |         | 8220-Modesto Dom Water                  |
| 201      | 701620  | 1.1  | MILLER, JEFFERY LEE (JEFF)    | P04 (overtime) | 13-Nov-04 | 4        | Hours       | \$213.33      |         | 8220-Modesto Dom Water                  |
| 202      | 701620  | 1.0  | MILLER, JEFFERY LEE (JEFF)    | Total Labor    |           |          | \$72.35     |               |         |   |
| 203      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 1              | 08-Jan-05 | 13       | Hours       | \$541.78      |         | 8410-Water Use, Planning & Conservation |
| 204      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 1              | 22-Jan-05 | 20       | Hours       | \$833.50      |         | 8410-Water Use, Planning & Conservation |
| 205      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 1              | 05-Feb-05 | 12       | Hours       | \$500.10      |         | 8410-Water Use, Planning & Conservation |
| 206      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 1              | 19-Feb-05 | 3        | Hours       | \$131.34      |         | 8410-Water Use, Planning & Conservation |
| 207      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 1              | 19-Mar-05 | 39       | Hours       | \$1,758.64    |         | 8410-Water Use, Planning & Conservation |
| 208      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 1              | 02-Apr-05 | 8        | Hours       | \$412.75      |         | 8410-Water Use, Planning & Conservation |
| 209      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 1              | 16-Apr-05 | 20       | Hours       | \$1,031.89    |         | 8410-Water Use, Planning & Conservation |
| 210      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 1              | 30-Apr-05 | 30       | Hours       | \$1,547.83    |         | 8410-Water Use, Planning & Conservation |
| 211      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 1              | 14-May-05 | 3        | Hours       | \$175.17      |         | 8410-Water Use, Planning & Conservation |
| 212      | 701620  | 1.0  | NOFFSINGER, GARY J (GARY)     | P12 (overtime) | 19-Mar-05 | 0        | Hours       | \$45.09       |         | 8410-Water Use, Planning & Conservation |
| 213      | 701620  | 1.0  | NOFFSINGER, GARY J (GARY)     | Total Labor    |           |          | \$6,978.09  |               |         |   |
| 214      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 27-Dec-03 | 4        | Hours       | \$126.77      |         | 8220-Modesto Dom Water                  |
| 215      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 27-Dec-03 | 14.5     | Hours       | \$1,296.25    |         | 8220-Modesto Dom Water                  |
| 216      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 10-Jan-04 | 4        | Hours       | \$326.76      |         | 8220-Modesto Dom Water                  |
| 217      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 07-Feb-04 | 11       | Hours       | \$651.55      |         | 8220-Modesto Dom Water                  |
| 218      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 21-Feb-04 | 11       | Hours       | \$895.89      |         | 8220-Modesto Dom Water                  |
| 219      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 06-Mar-04 | 24       | Hours       | \$1,962.96    |         | 8220-Modesto Dom Water                  |
| 220      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 20-Mar-04 | 5        | Hours       | \$408.95      |         | 8220-Modesto Dom Water                  |
| 221      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 03-Apr-04 | 3        | Hours       | \$245.37      |         | 8220-Modesto Dom Water                  |
| 222      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 17-Apr-04 | 2        | Hours       | \$165.58      |         | 8220-Modesto Dom Water                  |
| 223      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 01-May-04 | 10       | Hours       | \$817.90      |         | 8220-Modesto Dom Water                  |
| 224      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 15-May-04 | 10       | Hours       | \$817.90      |         | 8220-Modesto Dom Water                  |
| 225      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1              | 29-May-04 | 12       | Hours       | \$1,031.16    |         | 8220-Modesto Dom Water                  |

| Line No. | Project | Task | Employee/Supplier             | Expend Type | Item Date | Quantity | UOM   | Burdened Cost | Comment | Expend Org                |
|----------|---------|------|-------------------------------|-------------|-----------|----------|-------|---------------|---------|---------------------------|
| 224      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 12-Jun-04 | 10       | Hours | \$859.30      |         | 8220-Modesto Dom Water    |
| 225      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 26-Jun-04 | 10       | Hours | \$859.30      |         | 8220-Modesto Dom Water    |
| 226      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 10-Jul-04 | 10       | Hours | \$859.30      |         | 8220-Modesto Dom Water    |
| 227      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 24-Jul-04 | 10       | Hours | \$859.30      |         | 8220-Modesto Dom Water    |
| 228      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 07-Aug-04 | 10       | Hours | \$791.84      |         | 8220-Modesto Dom Water    |
| 229      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 21-Aug-04 | 5        | Hours | \$395.92      |         | 8220-Modesto Dom Water    |
| 230      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 04-Sep-04 | 10       | Hours | \$791.84      |         | 8220-Modesto Dom Water    |
| 231      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 18-Sep-04 | 10       | Hours | \$791.84      |         | 8220-Modesto Dom Water    |
| 232      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 02-Oct-04 | 17       | Hours | \$1,346.13    |         | 8220-Modesto Dom Water    |
| 233      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 16-Oct-04 | 10       | Hours | \$791.84      |         | 8220-Modesto Dom Water    |
| 234      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 30-Oct-04 | 15       | Hours | \$1,187.76    |         | 8220-Modesto Dom Water    |
| 235      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 13-Nov-04 | 10       | Hours | \$791.84      |         | 8220-Modesto Dom Water    |
| 236      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 27-Nov-04 | 7.5      | Hours | \$593.89      |         | 8220-Modesto Dom Water    |
| 237      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 11-Dec-04 | 12       | Hours | \$950.21      |         | 8220-Modesto Dom Water    |
| 238      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 25-Dec-04 | 15       | Hours | \$1,187.76    |         | 8220-Modesto Dom Water    |
| 239      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 08-Jan-05 | 4        | Hours | \$316.74      |         | 8220-Modesto Dom Water    |
| 240      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 22-Jan-05 | 12       | Hours | \$950.21      |         | 8220-Modesto Dom Water    |
| 241      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 05-Feb-05 | 17       | Hours | \$1,346.13    |         | 8220-Modesto Dom Water    |
| 242      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 19-Feb-05 | 12       | Hours | \$950.21      |         | 8220-Modesto Dom Water    |
| 243      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 05-Mar-05 | 26       | Hours | \$2,068.79    |         | 8220-Modesto Dom Water    |
| 244      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 19-Mar-05 | 8        | Hours | \$633.47      |         | 8220-Modesto Dom Water    |
| 245      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 02-Apr-05 | 29       | Hours | \$2,365.38    |         | 8220-Modesto Dom Water    |
| 246      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 16-Apr-05 | 10       | Hours | \$933.24      |         | 8220-Modesto Dom Water    |
| 247      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 30-Apr-05 | 14       | Hours | \$1,306.53    |         | 8220-Modesto Dom Water    |
| 248      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 14-May-05 | 16       | Hours | \$1,493.18    |         | 8220-Modesto Dom Water    |
| 249      | 701620  | 1.0  | RYAN, PATRICK J (PAT)         | 1           | 28-May-05 | 8        | Hours | \$844.94      |         | 8220-Modesto Dom Water    |
| 250      | 701620  | 1.0  | SMALLING, MARCINE A (MARCINE) | 1           | 27-Dec-03 | 5.5      | Hours | \$34,875.16   |         | 8220-Modesto Dom Water    |
| 251      | 701620  | 1.0  | ULM, AARON REYNOLDS (AARON)   | 1           | 04-Sep-04 | 2        | Hours | \$192.44      |         | 8420-Civil Engineering    |
| 252      | 701620  | 1.0  | ULM, AARON REYNOLDS (AARON)   | 1           | 18-Sep-04 | 4        | Hours | \$50.85       |         | 8420-Civil Engineering    |
| 253      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 22-Sep-01 | 2.5      | Hours | \$152.54      |         | 8010-AGM-Water Operations |
| 254      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 06-Oct-01 | 3        | Hours | \$199.28      |         | 8010-AGM-Water Operations |
| 255      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 20-Oct-01 | 2        | Hours | \$239.13      |         | 8010-AGM-Water Operations |
| 256      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 03-Nov-01 | 2        | Hours | \$159.42      |         | 8010-AGM-Water Operations |
| 257      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 17-Nov-01 | 4        | Hours | \$159.42      |         | 8010-AGM-Water Operations |
| 258      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 01-Dec-01 | 4        | Hours | \$318.85      |         | 8010-AGM-Water Operations |
| 259      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 15-Dec-01 | 4        | Hours | \$318.85      |         | 8010-AGM-Water Operations |
| 260      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 29-Dec-01 | 6        | Hours | \$497.40      |         | 8010-AGM-Water Operations |
| 261      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 12-Jan-02 | 9        | Hours | \$829.00      |         | 8010-AGM-Water Operations |
| 262      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 26-Jan-02 | 6        | Hours | \$748.10      |         | 8010-AGM-Water Operations |
| 263      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 09-Feb-02 | 6        | Hours | \$497.40      |         | 8010-AGM-Water Operations |
| 264      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 23-Feb-02 | 12       | Hours | \$497.40      |         | 8010-AGM-Water Operations |
| 265      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 09-Mar-02 | 12       | Hours | \$994.80      |         | 8010-AGM-Water Operations |
| 266      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 23-Mar-02 | 6        | Hours | \$994.80      |         | 8010-AGM-Water Operations |
| 267      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 06-Apr-02 | 8        | Hours | \$497.40      |         | 8010-AGM-Water Operations |
| 268      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 20-Apr-02 | 1.5      | Hours | \$663.20      |         | 8010-AGM-Water Operations |
| 269      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 04-May-02 | 4        | Hours | \$124.36      |         | 8010-AGM-Water Operations |
| 270      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 18-May-02 | 4        | Hours | \$331.60      |         | 8010-AGM-Water Operations |
| 271      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 01-Jun-02 | 4        | Hours | \$331.60      |         | 8010-AGM-Water Operations |
| 272      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 15-Jun-02 | 6        | Hours | \$497.40      |         | 8010-AGM-Water Operations |
| 273      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 29-Jun-02 | 10       | Hours | \$829.00      |         | 8010-AGM-Water Operations |
| 274      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 13-Jul-02 | 4        | Hours | \$331.60      |         | 8010-AGM-Water Operations |
| 275      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 27-Jul-02 | 2        | Hours | \$165.80      |         | 8010-AGM-Water Operations |
| 276      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 10-Aug-02 | 2        | Hours | \$169.59      |         | 8010-AGM-Water Operations |
| 277      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 24-Aug-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 278      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 07-Sep-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 279      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 21-Sep-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 280      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 05-Oct-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 281      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 19-Oct-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 282      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 02-Nov-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 283      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 16-Nov-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 284      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 30-Nov-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 285      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 14-Dec-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 286      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 28-Dec-02 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 287      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 11-Jan-03 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 288      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 25-Jan-03 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 289      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 08-Feb-03 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 290      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 22-Feb-03 | 4        | Hours | \$339.18      |         | 8010-AGM-Water Operations |
| 291      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 08-Mar-03 | 2        | Hours | \$192.40      |         | 8010-AGM-Water Operations |
| 292      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 22-Mar-03 | 2        | Hours | \$192.40      |         | 8010-AGM-Water Operations |
| 293      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 05-Apr-03 | 4        | Hours | \$384.79      |         | 8010-AGM-Water Operations |
| 294      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 19-Apr-03 | 2        | Hours | \$192.40      |         | 8010-AGM-Water Operations |
| 295      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 03-May-03 | 3        | Hours | \$288.59      |         | 8010-AGM-Water Operations |
| 296      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 17-May-03 | 3.5      | Hours | \$324.44      |         | 8010-AGM-Water Operations |
| 297      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 31-May-03 | 4        | Hours | \$384.79      |         | 8010-AGM-Water Operations |
| 298      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 14-Jun-03 | 4        | Hours | \$384.79      |         | 8010-AGM-Water Operations |
| 299      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 28-Jun-03 | 4        | Hours | \$384.79      |         | 8010-AGM-Water Operations |
| 300      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 12-Jul-03 | 8        | Hours | \$865.18      |         | 8010-AGM-Water Operations |
| 301      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 26-Jul-03 | 4        | Hours | \$432.59      |         | 8010-AGM-Water Operations |
| 302      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 09-Aug-03 | 3.5      | Hours | \$378.53      |         | 8010-AGM-Water Operations |
| 303      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 23-Aug-03 | 4        | Hours | \$432.59      |         | 8010-AGM-Water Operations |
| 304      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 06-Sep-03 | 4        | Hours | \$432.59      |         | 8010-AGM-Water Operations |
| 305      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 20-Sep-03 | 4        | Hours | \$432.59      |         | 8010-AGM-Water Operations |
| 306      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 04-Oct-03 | 6        | Hours | \$648.89      |         | 8010-AGM-Water Operations |
| 307      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 18-Oct-03 | 5        | Hours | \$540.74      |         | 8010-AGM-Water Operations |
| 308      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 01-Nov-03 | 3        | Hours | \$324.44      |         | 8010-AGM-Water Operations |
| 309      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 15-Nov-03 | 3        | Hours | \$324.44      |         | 8010-AGM-Water Operations |
| 310      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 29-Nov-03 | 6        | Hours | \$648.89      |         | 8010-AGM-Water Operations |
| 311      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 13-Dec-03 | 4        | Hours | \$477.72      |         | 8010-AGM-Water Operations |
| 312      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 27-Dec-03 | 10       | Hours | \$1,119.30    |         | 8010-AGM-Water Operations |
| 313      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 10-Jan-04 | 4        | Hours | \$409.13      |         | 8010-AGM-Water Operations |
| 314      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 24-Jan-04 | 6        | Hours | \$613.70      |         | 8010-AGM-Water Operations |
| 315      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 07-Feb-04 | 6        | Hours | \$611.84      |         | 8010-AGM-Water Operations |
| 316      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1           | 21-Feb-04 | 12       | Hours | \$1,223.69    |         | 8010-AGM-Water Operations |

| Line No. | Project | Task | Employee/Supplier             | Expend Type                | Item Date | Quantity | UOM      | Burdened Cost   | Comment  | Expend Org                              |
|----------|---------|------|-------------------------------|----------------------------|-----------|----------|----------|-----------------|--|---|
| 304      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 06-Mar-04 | 20       | Hours    | \$2,048.14      |  | 8010-AGM-Water Operations               |
| 305      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 20-Mar-04 | 6        | Hours    | \$614.44        |  | 8010-AGM-Water Operations               |
| 306      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 03-Apr-04 | 4        | Hours    | \$409.63        |  | 8010-AGM-Water Operations               |
| 307      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 17-Apr-04 | 8        | Hours    | \$819.26        |  | 8010-AGM-Water Operations               |
| 308      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 01-May-04 | 12       | Hours    | \$1,228.88      |  | 8010-AGM-Water Operations               |
| 309      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 15-May-04 | 8        | Hours    | \$819.26        |  | 8010-AGM-Water Operations               |
| 310      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 29-May-04 | 10       | Hours    | \$1,024.07      |  | 8010-AGM-Water Operations               |
| 311      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 12-Jun-04 | 15       | Hours    | \$1,536.11      |  | 8010-AGM-Water Operations               |
| 312      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 26-Jun-04 | 8        | Hours    | \$819.26        |  | 8010-AGM-Water Operations               |
| 313      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 10-Jul-04 | 8        | Hours    | \$819.26        |  | 8010-AGM-Water Operations               |
| 314      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 24-Jul-04 | 5        | Hours    | \$512.04        |  | 8010-AGM-Water Operations               |
| 315      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 07-Aug-04 | 18       | Hours    | \$1,698.62      |  | 8010-AGM-Water Operations               |
| 316      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 21-Aug-04 | 8.5      | Hours    | \$802.13        |  | 8010-AGM-Water Operations               |
| 317      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 04-Sep-04 | 20       | Hours    | \$1,887.36      |  | 8010-AGM-Water Operations               |
| 318      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 18-Sep-04 | 10       | Hours    | \$943.68        |  | 8010-AGM-Water Operations               |
| 319      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 02-Oct-04 | 11       | Hours    | \$1,038.05      |  | 8010-AGM-Water Operations               |
| 320      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 16-Oct-04 | 4        | Hours    | \$377.47        |  | 8010-AGM-Water Operations               |
| 321      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 30-Oct-04 | 2        | Hours    | \$188.74        |  | 8010-AGM-Water Operations               |
| 322      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 13-Nov-04 | 2        | Hours    | \$188.74        |  | 8010-AGM-Water Operations               |
| 323      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 27-Nov-04 | 4        | Hours    | \$377.47        |  | 8010-AGM-Water Operations               |
| 324      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 11-Dec-04 | 2        | Hours    | \$188.74        |  | 8010-AGM-Water Operations               |
| 325      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 25-Dec-04 | 5        | Hours    | \$471.84        |  | 8010-AGM-Water Operations               |
| 326      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 09-Jan-05 | 9        | Hours    | \$849.31        |  | 8010-AGM-Water Operations               |
| 327      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 22-Jan-05 | 1.5      | Hours    | \$141.55        |  | 8010-AGM-Water Operations               |
| 328      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 05-Feb-05 | 4        | Hours    | \$377.47        |  | 8010-AGM-Water Operations               |
| 329      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 19-Feb-05 | 3        | Hours    | \$283.10        |  | 8010-AGM-Water Operations               |
| 330      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 05-Mar-05 | 4        | Hours    | \$388.82        |  | 8010-AGM-Water Operations               |
| 331      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 19-Mar-05 | 4        | Hours    | \$444.88        |  | 8010-AGM-Water Operations               |
| 332      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 02-Apr-05 | 7        | Hours    | \$776.54        |  | 8010-AGM-Water Operations               |
| 333      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 16-Apr-05 | 5        | Hours    | \$556.10        |  | 8010-AGM-Water Operations               |
| 334      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 30-Apr-05 | 2        | Hours    | \$251.74        |  | 8010-AGM-Water Operations               |
| 335      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 1                          | 14-May-05 | 3        | Hours    | \$251.74        |  | 8010-AGM-Water Operations               |
| 336      | 701620  | 1.0  | MILLER, JEFFERY LEE (JEFF)    | 4                          | 29-May-04 | 2.5      | Hours    | \$46,451.39     |  | 8220-Modesto Dom Water                  |
| 337      | 701620  | 1.0  | NIEMI, MICHAEL JOHN (MICHAEL) | 12                         | 19-Mar-05 | 2        | Hours    | \$90.19         |  | 8410-Water Use, Planning & Conservation |
| 338      | 701620  | 1.0  | DIAS, GREGORY PAUL (GREG)     | 15                         | 29-Dec-01 | 0        | Hours    | \$0.00          |  | 8420-Civil Engineering                  |
| 339      | 701620  | 1.0  | DIAS, GREGORY PAUL (GREG)     | 15                         | 04-Oct-03 | 0        | Hours    | \$0.00          |  | 8420-Civil Engineering                  |
| 340      | 701620  | 1.0  | DIAS, GREGORY PAUL (GREG)     | 15                         | 01-Nov-03 | 0        | Hours    | \$0.00          |  | 8420-Civil Engineering                  |
| 341      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 18                         | 29-May-04 | 0        | Hours    | \$0.00          |  | 8010-AGM-Water Operations               |
| 342      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)      | 18                         | 18-Sep-04 | 0        | Hours    | \$0.00          |  | 8010-AGM-Water Operations               |
| 343      | 701620  | 1.0  | DIAS, GREGORY PAUL (GREG)     | 16                         | 09-Feb-02 | 0        | Hours    | \$0.00          |  | 8420-Civil Engineering                  |
| 344      | 701620  | 1.0  | DIAS, GREGORY PAUL (GREG)     | 16                         | 18-Oct-03 | 0        | Hours    | \$0.00          |  | 8420-Civil Engineering                  |
| 345      | 701620  | 1.0  | DIAS, GREGORY PAUL (GREG)     | 16                         | 01-Nov-03 | 0        | Hours    | \$0.00          |  | 8420-Civil Engineering                  |
|          |         |      | <b>Total Misc. Labor</b>      |                            |           |          |          | <b>\$234.89</b> |  |   |
| 346      | 701620  | 1.0  | ACCURALS/ADJUSTMENTS          | 111-Labor Accrual/Reversal | 31-Dec-04 | 905.04   | Currency | \$905.04        | 2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04          | 0000-Balance Sheet                      |
| 347      | 701620  | 1.1  | ACCURALS/ADJUSTMENTS          | 111-Labor Accrual/Reversal | 31-Dec-04 | 470.98   | Currency | \$470.98        | 2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04          | 0000-Balance Sheet                      |
| 348      | 701620  | 1.0  | ACCURALS/ADJUSTMENTS          | 111-Labor Accrual/Reversal | 01-Jan-05 | -905.04  | Currency | -\$905.04       | 2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04          | 0000-Balance Sheet                      |
| 349      | 701620  | 1.1  | ACCURALS/ADJUSTMENTS          | 112-Labor Accrual/Reversal | 01-Jan-05 | -470.98  | Currency | -\$470.98       | 2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04          | 0000-Balance Sheet                      |
| 350      | 701620  | 1.0  | ACCURALS/ADJUSTMENTS          | 112-Labor Corrections      | 05-Mar-05 | 64       | Currency | \$64.00         | ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05              | 8010-AGM-Water Operations               |
| 351      | 701620  | 1.0  | ACCURALS/ADJUSTMENTS          | 112-Labor Corrections      | 05-Mar-05 | 252      | Currency | \$252.00        | ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05              | 8220-Modesto Dom Water                  |
| 352      | 701620  | 1.0  | ACCURALS/ADJUSTMENTS          | 112-Labor Corrections      | 05-Mar-05 | 60       | Currency | \$60.00         | ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05              | 8410-Water Use, Planning & Conservation |
| 353      | 701620  | 1.0  | ACCURALS/ADJUSTMENTS          | 112-Labor Corrections      | 05-Mar-05 | 1012     | Currency | \$1,012.00      | ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05              | 8420-Civil Engineering                  |
| 354      | 701620  | 1.1  | ACCURALS/ADJUSTMENTS          | 112-Labor Corrections      | 05-Mar-05 | 115      | Currency | \$115.00        | ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05              | 8220-Modesto Dom Water                  |
| 355      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 2981.12  | Currency | \$2,981.12      | Smk Cost 14-Jul-01 DIAS, GREGORY PAUL (GREG) HOURS       | 0000-Balance Sheet                      |
| 356      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 576.28   | Currency | \$576.28        | Smk Cost 14-Jul-01 KETSCHER, WILLIAM M (BILL) 8.00 HOURS | 0000-Balance Sheet                      |
| 357      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 2856.91  | Currency | \$2,856.91      | Smk Cost 28-Jul-01 DIAS, GREGORY PAUL (GREG) 46.00 HOURS | 0000-Balance Sheet                      |
| 358      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 288.14   | Currency | \$288.14        | Smk Cost 28-Jul-01 KETSCHER, WILLIAM M (BILL) 4.00 HOURS | 0000-Balance Sheet                      |
| 359      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 1863.2   | Currency | \$1,863.20      | Smk Cost 11-Aug-01 DIAS, GREGORY PAUL (GREG) 30.00 HOURS | 0000-Balance Sheet                      |
| 360      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 993.71   | Currency | \$993.71        | Smk Cost 25-Aug-01 DIAS, GREGORY PAUL (GREG) 16.00 HOURS | 0000-Balance Sheet                      |
| 361      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 1490.56  | Currency | \$1,490.56      | Smk Cost 8-Sep-01 DIAS, GREGORY PAUL (GREG) 24.00 HOURS  | 0000-Balance Sheet                      |
| 362      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 200.65   | Currency | \$200.65        | Smk Cost 14-Jul-01 LIMA, JOSEPH M. (JOE) 3.00 HOURS      | 0000-Balance Sheet                      |
| 363      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 267.53   | Currency | \$267.53        | Smk Cost 28-Jul-01 LIMA, JOSEPH M. (JOE) 4.00 HOURS      | 0000-Balance Sheet                      |
| 364      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 66.88    | Currency | \$66.88         | Smk Cost 11-Aug-01 LIMA, JOSEPH M (JOE) 1.00 HOUR        | 0000-Balance Sheet                      |
| 365      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 01-Oct-03 | 133.77   | Currency | \$133.77        | Smk Cost 22-Sep-01 LIMA, JOSEPH M (JOE) 2.00 HOURS       | 0000-Balance Sheet                      |
| 366      | 701620  | 1.0  | SMITH CLEARING                | 112-Labor Corrections      | 02-Oct-03 | 1374.45  | Currency | \$1,374.45      | Smk Cost 28-Dec-02 DIAS, GREGORY PAUL (GREG) 20.00 HOURS | 0000-Balance Sheet                      |



| Line No. | Project | Task | Employee/Supplier                              | Expend Type   | Item Date | Quantity | UOM      | Burdened Cost       | Comment  | Expend Org             |
|----------|---------|------|--|---|-----------|----------|----------|---------------------|--|------------------------|
| 367      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 2405.29  | Currency | \$2,405.29          | Sunk Cost 14-Dec-02 DIAS, GREGORY PAUL (GREG) 35.00 HOURS      | 0000-Balance Sheet     |
| 368      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 726.89   | Currency | \$726.89            | Sunk Cost 30-Nov-02 DIAS, GREGORY PAUL (GREG) 11.00 HOURS      | 0000-Balance Sheet     |
| 369      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 1354.66  | Currency | \$1,354.66          | Sunk Cost 16-Nov-02 DIAS, GREGORY PAUL (GREG) 20.50 HOURS      | 0000-Balance Sheet     |
| 370      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 462.56   | Currency | \$462.56            | Sunk Cost 02-Nov-02 DIAS, GREGORY PAUL (GREG) 7.00 HOURS       | 0000-Balance Sheet     |
| 371      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 1354.66  | Currency | \$1,354.66          | Sunk Cost 19-Oct-02 DIAS, GREGORY PAUL (GREG) 20.50 HOURS      | 0000-Balance Sheet     |
| 372      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 2196.51  | Currency | \$2,196.51          | Sunk Cost 27-Jul-02 DIAS, GREGORY PAUL (GREG) 34.00 HOURS      | 0000-Balance Sheet     |
| 373      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 299.62   | Currency | \$299.62            | Sunk Cost 29-Jun-02 KETSCHER, WILLIAM M (BILL) 4.00 HOURS      | 0000-Balance Sheet     |
| 374      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 4493.48  | Currency | \$4,493.48          | Sunk Cost 24-Aug-02 DIAS, GREGORY PAUL (GREG) 68.00 HOURS      | 0000-Balance Sheet     |
| 375      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 1817.22  | Currency | \$1,817.22          | Sunk Cost 07-Sep-02 DIAS, GREGORY PAUL (GREG) 27.50 HOURS      | 0000-Balance Sheet     |
| 376      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 1585.93  | Currency | \$1,585.93          | Sunk Cost 21-Sep-02 DIAS, GREGORY PAUL (GREG) 24.00 HOURS      | 0000-Balance Sheet     |
| 377      | 701620  | 1.0  | SMITH CLEARING                                 | 112-Labor Corrections                                 | 02-Oct-03 | 2511.06  | Currency | \$2,511.06          | Sunk Cost 05-Oct-02 DIAS, GREGORY PAUL (GREG) 38.00 HOURS      | 0000-Balance Sheet     |
| 378      |         |      |  | <b>Total Labor Corrections</b>                        |           |          |          | <b>\$33,804.08</b>  |  |                        |
| 379      |         |      | <b>Total Labor</b>                             |   |           |          |          | <b>\$420,980.58</b> |  |                        |
| 380      |         |      |  |   |           |          |          |                     | <b>LINES 381-405 ARE MEMBRANE PILOT PLANT EXPENSES</b>         |                        |
| 381      | 701620  | 1.1  | BANK ONE, NA                                   | 201-Materials   | 15-Jan-04 | 440.22   | Currency | \$440.22            | MCMASTER-CARR SUPPLY 14-JAN-04                                 | 8220-Modesto Dom Water |
| 382      | 701620  | 1.1  | BANK ONE, NA                                   | 201-Materials   | 15-Jan-04 | 375.14   | Currency | \$375.14            | HARRINGTON PLASTICS 14-JAN-04                                  | 8220-Modesto Dom Water |
| 383      | 701620  | 1.1  | BANK ONE, NA                                   | 201-Materials   | 16-Jan-04 | 174.88   | Currency | \$174.88            | MCMASTER-CARR SUPPLY 15-JAN-04                                 | 8220-Modesto Dom Water |
| 384      | 701620  | 1.1  | BANK ONE, NA                                   | 201-Materials   | 22-Jan-04 | -18      | Currency | \$-18.00            | HARRINGTON PLASTICS 21-JAN-04                                  | 8220-Modesto Dom Water |
| 385      | 701620  | 1.1  | BANK ONE, NA                                   | 201-Materials   | 22-Jan-04 | 82.72    | Currency | \$82.72             | ORCHARD SUPPLY #201 20-JAN-04                                  | 8220-Modesto Dom Water |
| 386      | 701620  | 1.1  | BANK ONE, NA                                   | 201-Materials   | 29-Jan-04 | 1275.12  | Currency | \$1,275.12          | USA BLUE BOOK 27-JAN-04  | 8220-Modesto Dom Water |
| 387      | 701620  | 1.1  | BANK ONE, NA                                   | 201-Materials   | 31-Jan-04 | 185.09   | Currency | \$185.09            | USA BLUE BOOK  | 8220-Modesto Dom Water |
| 388      | 701620  | 1.1  | BANK ONE, NA                                   | 201-Materials   | 14-Jan-05 | 716.04   | Currency | \$716.04            | MCMASTER-CARR SUPPLY 13-JAN-05                                 | 8220-Modesto Dom Water |
| 389      | 701620  | 1.1  | BANK ONE, NA                                   | 201-Materials   | 17-Jan-05 | 324.57   | Currency | \$324.57            | MCMASTER-CARR SUPPLY 14-JAN-05                                 | 8220-Modesto Dom Water |
| 390      | 701620  | 1.0  | CENTER STATE PIPE & SUPPLY                     | <b>Total Bank One Material Purchases</b>              |           |          |          | <b>\$3,555.78</b>   |  |                        |
| 391      | 701620  | 1.0  | CENTER STATE PIPE & SUPPLY                     | 201-Materials   | 30-Dec-03 | 1100.71  | Currency | \$1,100.71          | PO 44100   | 0000-Balance Sheet     |
| 392      | 701620  | 1.0  | CENTER STATE PIPE & SUPPLY                     | 201-Materials   | 07-Jan-04 | 92.3     | Currency | \$92.30             | PO 44100   | 0000-Balance Sheet     |
| 393      | 701620  | 1.0  | CENTER STATE PIPE & SUPPLY                     | 201-Materials   | 07-Jan-04 | 36.61    | Currency | \$36.61             | PO 44100   | 0000-Balance Sheet     |
| 394      | 701620  | 1.0  | CENTER STATE PIPE & SUPPLY                     | 201-Materials   | 14-Jan-04 | 6.12     | Currency | \$6.12              | PO 44100   | 0000-Balance Sheet     |
| 395      | 701620  | 1.1  | CENTER STATE PIPE & SUPPLY                     | 201-Materials   | 26-Jan-04 | 150.49   | Currency | \$150.49            | PO 44100   | 0000-Balance Sheet     |
| 396      | 701620  | 1.1  | CENTER STATE PIPE & SUPPLY                     | 201-Materials   | 01-Feb-04 | 4.08     | Currency | \$4.08              | PO 44100   | 0000-Balance Sheet     |
| 397      | 701620  | 1.1  | SAFE-T-LITE                                    | <b>Total Center State Pipe Purchases</b>              |           |          |          | <b>\$1,404.49</b>   |  |                        |
| 398      | 701620  | 1.0  | WARDEN'S OFFICE                                | <b>Total Safe-T-Light Material Purchases</b>          |           |          |          | <b>\$1,407.20</b>   |  |                        |
| 399      | 701620  | 1.0  | WATERFORD FARM SUPPLY                          | <b>Total Warden's Office Material Purchases</b>       |           |          |          | <b>\$47.68</b>      |  |                        |
| 400      | 701620  | 1.0  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | <b>Total Waterford Farm Supply Material Purchases</b> |           |          |          | <b>\$161.50</b>     |  |                        |
| 401      | 701620  | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 201-Materials   | 07-Jan-04 | 3.89     | Currency | \$3.89              | PO 43410   | 0000-Balance Sheet     |
| 402      | 701620  | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 201-Materials   | 13-Jan-04 | 276.64   | Currency | \$276.64            | PO 43410   | 0000-Balance Sheet     |
| 403      | 701620  | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 201-Materials   | 13-Jan-04 | 209.58   | Currency | \$209.58            | PO 43410   | 0000-Balance Sheet     |
| 404      | 701620  | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 201-Materials   | 29-Jan-04 | 81.42    | Currency | \$81.42             | PO 43410   | 0000-Balance Sheet     |
| 405      | 701620  | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 201-Materials   | 29-Jan-04 | 78       | Currency | \$78.00             | PO 43410   | 0000-Balance Sheet     |
| 406      | 701620  | 1.0  | BANK ONE, NA                                   | <b>Total Wille Electric Supply Purchases</b>          |           |          |          | <b>\$446.94</b>     |  |                        |
| 407      | 701620  | 1.0  | OFFICE DEPOT BUSINESS SERVICES DIVISION - 1161 | <b>Total Stationery Supplies</b>                      |           |          |          | <b>\$1,096.47</b>   |  |                        |
| 408      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | <b>Total Bank One Stationary Supplies</b>             |           |          |          | <b>\$481.35</b>     |  |                        |
| 409      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 15-Mar-04 | 481.35   | Currency | \$481.35            | DITLOS 11-MAR-04   | 8220-Modesto Dom Water |
| 410      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 01-Feb-04 | 12.54    | Currency | \$12.54             | DOM WATER PHASE 2 / SUMMARY BILLING - 1/1/04 - 1/31/04         | 0000-Balance Sheet     |
| 411      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 21-Dec-01 | 10.74    | Currency | \$10.74             | 5634495300 / GREG DIAS   | 0000-Balance Sheet     |
| 412      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 18-Oct-02 | 15.28    | Currency | \$15.28             | 000977240305 / INVOICE SUMMARY OCT 18 2002 / ACCT #0952-0270-5 | 0000-Balance Sheet     |
| 413      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 18-Jul-03 | 11.83    | Currency | \$11.83             | G. DIAS / ACCT #0952-0270-5 / SUMMARY THROUGH JULY 18, 2003    | 0000-Balance Sheet     |
| 414      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 21-Nov-03 | 12.39    | Currency | \$12.39             | G. DIAS / ACCT #0952-0270-5 / SUMMARY NOV 21, 2003             | 0000-Balance Sheet     |
| 415      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 19-Dec-03 | 13.46    | Currency | \$13.46             | G. DIAS / ACCT #0952-0270-5 / SUMMARY DEC 19, 2003             | 0000-Balance Sheet     |
| 416      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 18-Feb-05 | 12.21    | Currency | \$12.21             | G. DIAS / ACCT #0952-0270-5 / SUMMARY 2/18/05                  | 0000-Balance Sheet     |
| 417      | 701620  | 1.0  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 18-Feb-05 | 22.75    | Currency | \$22.75             | G. DIAS / ACCT #0952-0270-5 / SUMMARY 2/18/05                  | 0000-Balance Sheet     |
| 418      | 701620  | 1.1  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 21-Mar-05 | 11.19    | Currency | \$11.19             | G. DIAS / ACCT #0952-0270-5 / SUMMARY 3/21/05                  | 0000-Balance Sheet     |
| 419      | 701620  | 1.1  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 21-Mar-05 | 25.66    | Currency | \$25.66             | G. DIAS / ACCT #0952-0270-5 / SUMMARY 3/21/05                  | 0000-Balance Sheet     |
| 420      | 701620  | 1.1  | FEDERAL EXPRESS CORPORATION                    | 205-Postage/Express                                   | 21-Mar-05 | 18.07    | Currency | \$18.07             | G. DIAS / ACCT #0952-0270-5 / SUMMARY 3/21/05                  | 0000-Balance Sheet     |
| 421      |         |      |  | <b>Total Fed Ex Postage</b>                           |           |          |          | <b>\$170.97</b>     |  |                        |
| 422      |         |      |  |   |           |          |          |                     | <b>LINES 419-438 ARE MEMBRANE PILOT PLANT EXPENSES</b>         |                        |
| 423      | 701620  | 1.1  | BANK ONE, NA                                   | 207-Freight   | 03-Feb-04 | 43.1     | Currency | \$43.10             | FEDEX FREIGHT WEST INC 02-FEB-04                               | 8220-Modesto Dom Water |
| 424      | 701620  | 1.0  | BANK ONE, NA                                   | <b>Total Bank One Freight</b>                         |           |          |          | <b>\$43.10</b>      |  |                        |
| 425      | 701620  | 1.0  | BANK ONE, NA                                   | 214-Repair Parts                                      | 26-Dec-03 | 1014.78  | Currency | \$1,014.78          | USA BLUE BOOK 23-DEC-03  | 8220-Modesto Dom Water |

| Line   | Project No. | Task | Employee/Supplier                              | Expend Type                              | Item Date | Quantity | UOM      | Burdened Cost | Comment   | Expend Org             |
|--------|-------------|------|--|--|-----------|----------|----------|---------------|---|------------------------|
| 421    | 701620      | 1.1  | BANK ONE, NA                                   | 214-Repair Parts                         | 05-Feb-04 | 21.45    | Currency | \$21.45       | ORCHARD SUPPLY #201 03-FEB-04   | 8220-Modesto Dom Water |
| 422    | 701620      | 1.1  | BANK ONE, NA                                   | 214-Repair Parts                         | 06-Feb-04 | 29.46    | Currency | \$29.46       | ORCHARD SUPPLY #201 04-FEB-04   | 8220-Modesto Dom Water |
| 423    | 701620      | 1.1  | BANK ONE, NA                                   | 214-Repair Parts                         | 23-Feb-04 | 514.65   | Currency | \$514.65      | USA BLUE BOOK 19-FEB-04   | 8220-Modesto Dom Water |
| 424    | 701620      | 1.1  | WATERFORD FARM SUPPLY                          | Total Bank One Repair Parts              | 08-Jul-04 | 16.83    | Currency | \$1,580.34    |   | 0000-Balance Sheet     |
| 425    | 701620      | 1.1  | BANK ONE, NA                                   | Total Waterford Farm Supply Repair Parts | 04-Oct-04 | 162.15   | Currency | \$16.83       |   | 8220-Modesto Dom Water |
| 426    | 701620      | 1.1  | BANK ONE, NA                                   | 217-Small Tools                          | 20-Oct-04 | 1303.6   | Currency | \$1,303.60    | MCMASTER-CARR SUPPLY 01-OCT-04  | 8220-Modesto Dom Water |
| 427    | 701620      | 1.1  | SAFE-T-LITE                                    | Total Bank One Small Tool Purchases      | 27-Apr-04 | 1299     | Currency | \$1,465.75    |   | 0000-Balance Sheet     |
| 428    | 701620      | 1.0  | BANK ONE, NA                                   | Total Safe-T-Life Safety Equipment       | 31-Dec-03 | 67.45    | Currency | \$1,299.00    |   | 0000-Balance Sheet     |
| 429    | 701620      | 1.1  | BANK ONE, NA                                   | 255-Material Sales Tax                   | 31-Jan-04 | 84.81    | Currency | \$67.45       | KENNETH EDWARDS 31-DEC-03   | 0000-Balance Sheet     |
| 430    | 701620      | 1.1  | BANK ONE, NA                                   | 255-Material Sales Tax                   | 31-Jan-04 | 6.49     | Currency | \$84.81       | JEFF L MILLER 31-JAN-04   | 0000-Balance Sheet     |
| 431    | 701620      | 1.1  | BANK ONE, NA                                   | 255-Material Sales Tax                   | 29-Feb-04 | 35.21    | Currency | \$6.49        | KENNETH EDWARDS 31-JAN-04   | 0000-Balance Sheet     |
| 432    | 701620      | 1.0  | CENTER STATE PIPE & SUPPLY                     | 255-Material Sales Tax                   | 30-Dec-03 | 81.18    | Currency | \$6.49        | SALES TAX / USA BLUE BOOK 19-FEB-04   | 0000-Balance Sheet     |
| 433    | 701620      | 1.0  | CENTER STATE PIPE & SUPPLY                     | 255-Material Sales Tax                   | 07-Jan-04 | 6.81     | Currency | \$6.81        | PO 44100  | 0000-Balance Sheet     |
| 434    | 701620      | 1.0  | CENTER STATE PIPE & SUPPLY                     | 255-Material Sales Tax                   | 07-Jan-04 | 2.7      | Currency | \$2.70        | PO 44100  | 0000-Balance Sheet     |
| 435    | 701620      | 1.0  | CENTER STATE PIPE & SUPPLY                     | 255-Material Sales Tax                   | 14-Jan-04 | 0.45     | Currency | \$0.45        | PO 44100  | 0000-Balance Sheet     |
| 436    | 701620      | 1.1  | CENTER STATE PIPE & SUPPLY                     | 255-Material Sales Tax                   | 26-Jan-04 | 11.1     | Currency | \$11.10       | PO 44100  | 0000-Balance Sheet     |
| 437    | 701620      | 1.1  | CENTER STATE PIPE & SUPPLY                     | 255-Material Sales Tax                   | 01-Feb-04 | 0.3      | Currency | \$0.30        | PO 44100  | 0000-Balance Sheet     |
| 438    | 701620      | 1.1  | CENTER STATE PIPE & SUPPLY                     | 255-Material Sales Tax                   | 01-Feb-04 | 1.05     | Currency | \$1.05        | PO 44100  | 0000-Balance Sheet     |
| 439    | 701620      | 1.0  | OFFICE DEPOT BUSINESS SERVICES DIVISION - 1161 | 255-Material Sales Tax                   | 01-Feb-04 | 0.92     | Currency | \$0.92        | 1/3/104   | 0000-Balance Sheet     |
| 440    | 701620      | 1.1  | SAFE-T-LITE                                    | 255-Material Sales Tax                   | 27-Apr-04 | 95.81    | Currency | \$95.81       | PO 42930  | 0000-Balance Sheet     |
| 441    | 701620      | 1.1  | SAFE-T-LITE                                    | 255-Material Sales Tax                   | 22-Oct-04 | 103.78   | Currency | \$103.78      | PO 42930  | 0000-Balance Sheet     |
| 442    | 701620      | 1.0  | WARDENS OFFICE                                 | 255-Material Sales Tax                   | 04-Feb-04 | 3.52     | Currency | \$3.52        | PO 44670 / WATER OPS  | 0000-Balance Sheet     |
| 443    | 701620      | 1.0  | WATERFORD FARM SUPPLY                          | 255-Material Sales Tax                   | 07-Jan-04 | 11.91    | Currency | \$11.91       | PO 43010  | 0000-Balance Sheet     |
| 444    | 701620      | 1.1  | WATERFORD FARM SUPPLY                          | 255-Material Sales Tax                   | 09-Jul-04 | 0.28     | Currency | \$1.24        | PO 43010 / REF 92030  | 0000-Balance Sheet     |
| 445    | 701620      | 1.0  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 255-Material Sales Tax                   | 07-Jan-04 | 20.4     | Currency | \$0.28        | PO 43410  | 0000-Balance Sheet     |
| 446    | 701620      | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 255-Material Sales Tax                   | 13-Jan-04 | 15.46    | Currency | \$20.40       | PO 43410  | 0000-Balance Sheet     |
| 447    | 701620      | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 255-Material Sales Tax                   | 13-Jan-04 | 15.46    | Currency | \$15.46       | PO 43410  | 0000-Balance Sheet     |
| 448    | 701620      | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 255-Material Sales Tax                   | 13-Jan-04 | 6.01     | Currency | \$6.01        | PO 43410  | 0000-Balance Sheet     |
| 449    | 701620      | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 255-Material Sales Tax                   | 29-Jan-04 | 5.76     | Currency | \$5.76        | PO 43410  | 0000-Balance Sheet     |
| 450    | 701620      | 1.1  | WILLE ELECTRIC SUPPLY COMPANY, INC.            | 255-Material Sales Tax                   | 29-Jan-04 | 32.96    | Currency | \$32.96       | PO 43410  | 0000-Balance Sheet     |
| 451    |             |      |  | Total Sales Tax                          |           |          |          | \$595.60      |   |                        |
| 452    |             |      |  | Total Materials and Supplies             |           |          |          | \$13,338.60   |   |                        |
| 453    |             |      |  |  |           |          |          |               |   |                        |
| 454    | 701620      | 1.0  | BLACK & VEATCH                                 | 401-Consulting                           | 05-Sep-03 | 3050     | Currency | \$3,050.00    | REF 65518 / 8/1/03-8/29/03 / PROF SVCS / WTP PHASE                                    | 0000-Balance Sheet     |
| 455    | 701620      | 1.0  | BLACK & VEATCH                                 | 401-Consulting                           | 02-Oct-03 | 14761.86 | Currency | \$14,761.86   | CLIENT REF 65518 / PROF SVCS 8/29/03-9/26/03 / WTP PHASE II                           | 0000-Balance Sheet     |
| 456    | 701620      | 1.0  | BLACK & VEATCH                                 | 401-Consulting                           | 05-Nov-03 | 56476.2  | Currency | \$56,476.20   | PROF SVCS / MRWTP PHASE 2 / 9/26/03-10/31/03  | 0000-Balance Sheet     |
| 457    | 701620      | 1.0  | BLACK & VEATCH                                 | 401-Consulting                           | 04-Dec-03 | 27361.5  | Currency | \$27,361.50   | PROFESSIONAL SERVICES - NOV 03 BILLING / MRWTP PHASE TWO EXPANSION PROJECT            | 0000-Balance Sheet     |
| 458    | 701620      | 1.0  | BLACK & VEATCH                                 | 401-Consulting                           | 31-Dec-03 | 5570     | Currency | \$5,570.00    | PROFESSIONAL SERVICES -MRWTP PHASE TWO EXPANSION PROJECT / DEC 03 BILLING             | 0000-Balance Sheet     |
| 459    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 11-Feb-04 | 63533.2  | Currency | \$63,533.20   | PROF SVCS 12/26/03-1/30/04 FOR BILLING  | 0000-Balance Sheet     |
| 460    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 05-Mar-04 | 48858    | Currency | \$48,858.00   | PROFESSIONAL SERVICES / FEB 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT            | 0000-Balance Sheet     |
| 461    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 05-Apr-04 | 25788.81 | Currency | \$25,788.81   | PROF SVCS 2/27/04-3/26/04 FOR MRWTP PHASE 2 EXPANSION                                 | 0000-Balance Sheet     |
| 462    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 13-May-04 | 33628.68 | Currency | \$33,628.68   | PROFESSIONAL SERVICES - APR 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT            | 0000-Balance Sheet     |
| 463    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 03-Jun-04 | 38684.87 | Currency | \$38,684.87   | PROFESSIONAL SERVICES -MAY 04 BILLING / MRWTP PHASE TWO                               | 0000-Balance Sheet     |
| 464    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 06-Jul-04 | 15218.67 | Currency | \$15,218.67   | PROFESSIONAL SERVICES / JUN 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT            | 0000-Balance Sheet     |
| 465    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 04-Aug-04 | 32358.65 | Currency | \$32,358.65   | PROFESSIONAL SERVICES / JUL 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT            | 0000-Balance Sheet     |
| 466    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 02-Sep-04 | 34883.74 | Currency | \$34,883.74   | PROFESSIONAL SERVICES / MRWTP PHASE TWO EXPANSION PROJECT AUG 04 BILLING              | 0000-Balance Sheet     |
| 467    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 30-Sep-04 | 59764.5  | Currency | \$59,764.50   | PROFESSIONAL SERVICES / AUG 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT            | 0000-Balance Sheet     |
| 468    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 08-Nov-04 | 61809.18 | Currency | \$61,809.18   | PROF SVCS 9/24/04-10/29/04 /MRWTP PHASE 2 EXPANSION PROJECT                           | 0000-Balance Sheet     |
| 469    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 01-Dec-04 | 25424.5  | Currency | \$25,424.50   | PROFESSIONAL SERVICES / NOV 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT            | 0000-Balance Sheet     |
| 470    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 31-Dec-04 | 18609.56 | Currency | \$18,609.56   | PROF SVCS / MRWTP PHASE 2 EXP PROJ / 11/26/04-12/31/04                                | 0000-Balance Sheet     |
| 471    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 01-Apr-05 | 15632.81 | Currency | \$15,632.81   | CLIENT 65518 / PROF SVCS /MRWTP PHASE 2 EXP PROJ                                      | 0000-Balance Sheet     |
| 472    | 701620      | 1.1  | BLACK & VEATCH                                 | 401-Consulting                           | 01-Apr-05 | 35873.36 | Currency | \$35,873.36   | CLIENT 65518 / PROF SVCS /MRWTP PHASE 2 EXP PROJ / 2/5/05-3/4/05                      | 0000-Balance Sheet     |
| 701620 |             |      |  | Total Black & Veatch Consulting          | 31-Dec-04 | 10075.00 | Currency | \$617,188.09  |   |                        |
| 701620 |             |      |  | Total Black & Veatch Consulting          | 03-May-05 | 4200.00  | Currency | \$4,200.00    | 77.5 hrs @ \$130 per hr for Water Rights consulting                                   |                        |
| 701620 |             |      |  | Total William Johnston Consulting        |           |          |          | \$14,275.00   | 30 hrs @ \$140 per hr for Water Rights consulting                                     |                        |
| 473    | 701620      | 1.1  | JONES & STOKES ASSOCIATES                      | 401-Consulting                           | 14-Jan-04 | 8411.6   | Currency | \$8,411.60    | PROFESSIONAL SERVICES - MRWTP PHASE TWO EXPANSION PROJECT SEIR / NOV 24- DEC 28, 2003 | 0000-Balance Sheet     |

| Line No. | Project | Task | Employee/Supplier           | Expend Type                                     | Item Date | Quantity | UOM      | Burdened Cost | Comment  | Expend Org             |
|----------|---------|------|-----------------------------|---|-----------|----------|----------|---------------|--|------------------------|
| 474      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 08-Feb-04 | 13196.85 | Currency | \$13,196.85   | PROF SVCS - MRWTP PHASE 2 EXPANSION PROJECT SEIR / 12/29/03-1/25/04                | 0000-Balance Sheet     |
| 475      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 10-Mar-04 | 35368.47 | Currency | \$35,368.47   | PROFESSIONAL SERVICES - FEB 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR    | 0000-Balance Sheet     |
| 476      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 08-Apr-04 | 13399.51 | Currency | \$13,399.51   | PROFESSIONAL SERVICES - MAR 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR    | 0000-Balance Sheet     |
| 477      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 10-May-04 | 19462.78 | Currency | \$19,462.78   | PROFESSIONAL SERVICES - APR 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR    | 0000-Balance Sheet     |
| 478      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 08-Jun-04 | 5366.49  | Currency | \$5,366.49    | PROFESSIONAL SERVICES - MAY 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR    | 0000-Balance Sheet     |
| 479      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 13-Jul-04 | 7978.92  | Currency | \$7,978.92    | JUN 04 BILLING / MRWTP PHASE TWO EXPANSIONS PROJECT SEIR                           | 0000-Balance Sheet     |
| 480      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 10-Aug-04 | 4255.84  | Currency | \$4,255.84    | PROFESSIONAL SERVICES / JUL 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR    | 0000-Balance Sheet     |
| 481      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 01-Sep-04 | 17635.27 | Currency | \$17,635.27   | PROFESSIONAL SERVICES / AUG 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR    | 0000-Balance Sheet     |
| 482      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 13-Oct-04 | 22229.32 | Currency | \$22,229.32   | PROFESSIONAL SERVICES - AUG 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR    | 0000-Balance Sheet     |
| 483      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 03-Nov-04 | 11132.79 | Currency | \$11,132.79   | PROF SVCS - 9/27/04-10/24/04 / MRWTP PHASE 2 EXPANSION PROJECT SEIR                | 0000-Balance Sheet     |
| 484      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 01-Dec-04 | 4946.92  | Currency | \$4,946.92    | PROFESSIONAL SERVICES / NOV 04 BILLING / MRWTP - PHASE TWO EXPANSION PROJECT SEIR  | 0000-Balance Sheet     |
| 485      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 10-Jan-05 | 11080.32 | Currency | \$11,080.32   | PROF SVCS - 11/22/04-12/26/04 / MRWTP PHASE 2 EXPANSION PROJECT SEIR               | 0000-Balance Sheet     |
| 486      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 04-Feb-05 | 3400.14  | Currency | \$3,400.14    | PROF SVCS - 12/27/04-1/23/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR                | 0000-Balance Sheet     |
| 487      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 01-Mar-05 | 2906.1   | Currency | \$2,906.10    | PROF SVCS - 1/24/05-2/20/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR                 | 0000-Balance Sheet     |
| 488      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 12-Apr-05 | 1496.47  | Currency | \$1,496.47    | MRWTP PHASE 2 EXPANSION PROJECT SEIR   | 0000-Balance Sheet     |
| 489      | 701620  | 1.1  | JONES & STOKES ASSOCIATES   | 401-Consulting                                  | 03-May-05 | 705.18   | Currency | \$705.18      | PROJ 03564.03 / PROF SVCS - 3/28/05-4/24/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR | 0000-Balance Sheet     |
| 490      | 701620  | 1.1  | KATZ & ASSOCIATES           | Total Jones & Stokes Consulting                 | 01-Apr-04 | 2145     | Currency | \$2,145.00    | PROF SVCS OF CRAIG MOYLE THRU 2/29/04  | 0000-Balance Sheet     |
| 491      | 701620  | 1.1  | KATZ & ASSOCIATES           | 401-Consulting                                  | 01-Apr-04 | 163.7    | Currency | \$163.70      | PROFESSIONAL SERVICES - MAR 04 BILLING   | 0000-Balance Sheet     |
| 492      | 701620  | 1.1  | KATZ & ASSOCIATES           | 401-Consulting                                  | 01-Jun-04 | 279.38   | Currency | \$279.38      | PROFESSIONAL SERVICES / APR 04 BILLING / CLIENT #SC1123L                           | 0000-Balance Sheet     |
| 493      | 701620  | 1.1  | AL CALA & ASSOCIATES        | Total Katz & Associates Consulting              |           |          |          | \$2,588.08    | LINE 493 IS COURT REPORTER   |                        |
| 494      | 701620  | 1.1  | BANK ONE, NA                | 425-Other Outside Services                      | 31-Dec-04 | 230      | Currency | \$230.00      | 2 PUBLIC MTGS FOR MRWTP PHASE 2 EXPANSION  | 0000-Balance Sheet     |
| 495      | 701620  | 1.1  | BANK ONE, NA                | Total AI Cala & Associates Consulting           |           |          |          | \$230.00      | COURT REPORTER   |                        |
| 496      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 23-Aug-04 | 900      | Currency | \$900.00      | \$10.74 AUDIO VIDEO HQ 09-APR-04   | 8220-Modesto Dom Water |
| 497      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 01-Feb-05 | 300      | Currency | \$300.00      | \$42.95 AUDIO VIDEO HQ 08-APR-04   | 8220-Modesto Dom Water |
| 498      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 07-Feb-05 | 240      | Currency | \$240.00      |  |                        |
| 499      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 07-Feb-05 | 320      | Currency | \$320.00      |  |                        |
| 500      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 07-Feb-05 | 565      | Currency | \$565.00      |  |                        |
| 501      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 09-Feb-05 | 390      | Currency | \$390.00      |  |                        |
| 502      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 18-Feb-05 | 239      | Currency | \$239.00      |  |                        |
| 503      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 23-Feb-05 | 35       | Currency | \$35.00       |  |                        |
| 504      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 24-Feb-05 | 170      | Currency | \$170.00      |  |                        |
| 505      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 25-Feb-05 | 900      | Currency | \$900.00      |  |                        |
| 506      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 01-Mar-05 | 35       | Currency | \$35.00       |  |                        |
| 507      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 10-Mar-05 | 2265     | Currency | \$2,265.00    |  |                        |
| 508      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 17-Mar-05 | 207.5    | Currency | \$207.50      |  |                        |
| 509      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 21-Mar-05 | 185      | Currency | \$185.00      |  |                        |
| 510      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 21-Mar-05 | 317      | Currency | \$317.00      |  |                        |
| 511      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 22-Mar-05 | 207.5    | Currency | \$207.50      |  |                        |
| 512      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 07-Apr-05 | 230      | Currency | \$230.00      |  |                        |
| 514      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 11-Apr-05 | 2250     | Currency | \$2,250.00    |  |                        |
| 515      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 14-Apr-05 | 155      | Currency | \$155.00      |  |                        |
| 516      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 25-Apr-05 | 185      | Currency | \$185.00      |  |                        |
| 517      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 06-May-05 | 339      | Currency | \$339.00      |  |                        |
| 518      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 11-May-05 | 445      | Currency | \$445.00      |  |                        |
| 519      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 24-May-05 | 495      | Currency | \$495.00      |  |                        |
| 520      | 701620  | 1.1  | BSK ANALYTICAL LABORATORIES | 425-Other Outside Services                      | 24-May-05 | 3075     | Currency | \$3,075.00    |  |                        |
| 521      | 701620  | 1.0  | CALIFORNIA CAD SOLUTIONS    | Total BSK Analytical Lab Outside Services       |           |          |          | \$14,510.00   |  |                        |
| 522      | 701620  | 1.0  | MARTINO GRAPHIC DESIGN      | 425-Other Outside Services                      | 28-Dec-04 | 2815     | Currency | \$2,815.00    | SCAN, PLACE & RUBBER SHEET 10 AERIAL PHOTOS  | 0000-Balance Sheet     |
| 523      | 701620  | 1.0  | SMITH CLEARING              | Total California CAD Solutions Outside Services |           |          |          | \$2,815.00    | AGREEMENT MAP FOR SWRCB  |                        |
| 524      | 701620  | 1.0  | SMITH CLEARING              | 425-Other Outside Services                      | 08-Jun-04 | 1779.92  | Currency | \$1,779.92    | WTP NEWSLETTER   | 0000-Balance Sheet     |
| 525      | 701620  | 1.0  | SMITH CLEARING              | Total Martino Graphic Design Outside Services   |           |          |          | \$1,779.92    |  |                        |
| 526      | 701620  | 1.0  | SMITH CLEARING              | 425-Other Outside Services                      | 02-Oct-03 | 1715     | Currency | \$1,715.00    | Slunk Cost 01-Jun-02 KATZ & ASSOCIATES   | 0000-Balance Sheet     |
| 527      | 701620  | 1.0  | SMITH CLEARING              | 425-Other Outside Services                      | 02-Oct-03 | 6701.25  | Currency | \$6,701.25    | Slunk Cost 01-Jun-02 KATZ & ASSOCIATES   | 0000-Balance Sheet     |
| 528      | 701620  | 1.0  | SMITH CLEARING              | 425-Other Outside Services                      | 02-Oct-03 | 805.25   | Currency | \$808.25      | Slunk Cost 01-Jun-02 KATZ & ASSOCIATES   | 0000-Balance Sheet     |
| 529      | 701620  | 1.0  | SMITH CLEARING              | 425-Other Outside Services                      | 02-Oct-03 | 2572.94  | Currency | \$2,572.94    | Slunk Cost 01-Jun-02 KATZ & ASSOCIATES   | 0000-Balance Sheet     |
| 530      | 701620  | 1.0  | SMITH CLEARING              | 425-Other Outside Services                      | 02-Oct-03 | 5290.91  | Currency | \$5,290.91    | Slunk Cost 01-Jun-02 KATZ & ASSOCIATES   | 0000-Balance Sheet     |

| Line | Project No. | Task | Employee/Supplier         | Expend Type  | Item Date | Quantity | UOM      | Burdened Cost       | Comment   | Expend Org             |
|------|-------------|------|---------------------------|--|-----------|----------|----------|---------------------|---|------------------------|
| 528  | 701620      | 1.0  | SMITH CLEARING            | 425-Other Outside Services                             | 02-Oct-03 | 8544.17  | Currency | \$8,544.17          | Slmk Cost-10-Jul-02 ACCOUNTS RECEIVABLE                     | 0000-Balance Sheet     |
|      |             |      |                           | <b>Total Financial Adjustments to Outside Services</b> |           |          |          | <b>\$8,544.18</b>   |   |                        |
| 529  | 701620      | 1.0  | CALIFORNIA CAD SOLUTIONS  | 455-Outside Services Sales Tax                         | 28-Dec-04 | 1.11     | Currency | \$1.11              | SCAN, PLACE & RUBBER SHEET 10 AERIAL PHOTOS                 | 0000-Balance Sheet     |
| 530  | 701620      | 1.0  | MARTINO GRAPHIC DESIGN    | 455-Outside Services Sales Tax                         | 08-Jun-04 | 131.27   | Currency | \$131.27            | PO 44563 / WTP NEWSLETTER                                   | 0000-Balance Sheet     |
| 531  |             |      |                           | <b>Total Outside Services Tax</b>                      |           |          |          | <b>\$132.38</b>     |   |                        |
| 532  |             |      |                           | <b>Total Outside Services</b>                          |           |          |          | <b>\$845,089.31</b> |   |                        |
| 533  |             |      |                           |  |           |          |          |                     | <b>LINE5 534-538 Scottsdale Wtr Campus: Mesa CAP Plant</b>  |                        |
| 534  | 701620      | 1.1  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 26-Feb-04 | 292.3    | Currency | \$292.30            | G. DIAS / ACCT #3782-911358-11007 / FEB 04 BILLING          | 0000-Balance Sheet     |
| 535  | 701620      | 1.1  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 26-Feb-04 | 20       | Currency | \$20.00             | SERVICE FEE / ACCT #3782-911358-11007 / FEB 04 BILLING      | 0000-Balance Sheet     |
| 536  | 701620      | 1.1  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 26-Feb-04 | 40       | Currency | \$40.00             | SERVICE FEE / ACCT #3782-911358-11007 / FEB 04 BILLING      | 0000-Balance Sheet     |
| 537  | 701620      | 1.1  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 26-Feb-04 | 255.3    | Currency | \$255.30            | P. RYAN / ACCT #3782-911358-11007 / FEB 04 BILLING          | 0000-Balance Sheet     |
| 538  | 701620      | 1.1  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 26-Feb-04 | 255.3    | Currency | \$255.30            | W. WARD / ACCT #3782-911358-11007 / FEB 04 BILLING          | 0000-Balance Sheet     |
|      |             |      |                           |  |           |          |          |                     | <b>LINE5 539-545 OCWD WWTP - Submerged membranes</b>        |                        |
| 539  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Jun-04 | 209.7    | Currency | \$209.70            | W. WARD / ACCT #3782-911358-11007 / MAY 04 BILLING          | 0000-Balance Sheet     |
| 540  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Jun-04 | 209.7    | Currency | \$209.70            | G. DIAS / ACCT #3782-911358-11007 / MAY 04 BILLING          | 0000-Balance Sheet     |
| 541  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Jun-04 | 209.7    | Currency | \$209.70            | P. RYAN / ACCT #3782-911358-11007 / MAY 04 BILLING          | 0000-Balance Sheet     |
| 542  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Jun-04 | -209.7   | Currency | -\$209.70           | P. RYAN / ACCT #3782-911358-11007 / MAY 04 BILLING          | 0000-Balance Sheet     |
| 543  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Jun-04 | 209.7    | Currency | \$209.70            | K. EDWARDS / ACCT #3782-911358-11007 / MAY 04 BILLING       | 0000-Balance Sheet     |
| 544  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Jun-04 | 209.7    | Currency | \$209.70            | C. HIDAH / ACCT #3782-911358-11007 / MAY 04 BILLING         | 0000-Balance Sheet     |
| 545  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Jun-04 | 100      | Currency | \$100.00            | W. WARD / ACCT #3782-911358-11007 / MAY 04 BILLING          | 0000-Balance Sheet     |
| 546  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 138.39   | Currency | \$138.39            | P. RYAN / ACCT #3782-911358-11007 / FEB 05 BILLING          | 0000-Balance Sheet     |
| 547  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 20       | Currency | \$20.00             | SERVICE CHARGE / ACCT #3782-911358-11007 / FEB 05 BILLING   | 0000-Balance Sheet     |
|      |             |      |                           |  |           |          |          |                     | <b>LINE5 548-554 OCWD WWTP - Submerged membranes</b>        |                        |
| 548  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 215.39   | Currency | \$215.39            | P. RYAN / ACCT #3782-911358-11007 / FEB 05 BILLING          | 0000-Balance Sheet     |
| 549  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 60       | Currency | \$60.00             | 3 SERVICE CHARGES   | 0000-Balance Sheet     |
| 550  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 215.39   | Currency | \$215.39            | K. EDWARDS / ACCT #3782-911358-11007 / FEB 05 BILLING       | 0000-Balance Sheet     |
| 551  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 215.39   | Currency | \$215.39            | J. MILLER / ACCT #3782-911358-11007 / FEB 05 BILLING        | 0000-Balance Sheet     |
| 552  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 215.39   | Currency | \$215.39            | J. MILLER / ACCT #3782-911358-11007 / FEB 05 BILLING        | 0000-Balance Sheet     |
| 553  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 215.39   | Currency | \$215.39            | J. MILLER / ACCT #3782-911358-11007 / FEB 05 BILLING        | 0000-Balance Sheet     |
| 554  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 215.39   | Currency | \$215.39            | J. MILLER / ACCT #3782-911358-11007 / FEB 05 BILLING        | 0000-Balance Sheet     |
| 555  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 215.39   | Currency | \$215.39            | J. MILLER / ACCT #3782-911358-11007 / FEB 05 BILLING        | 0000-Balance Sheet     |
| 556  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 215.39   | Currency | \$215.39            | J. MILLER / ACCT #3782-911358-11007 / FEB 05 BILLING        | 0000-Balance Sheet     |
| 557  | 701620      | 1.0  | AMERICAN EXPRESS          | 501-Transportation-Commercial                          | 01-Mar-05 | 215.39   | Currency | \$215.39            | J. MILLER / ACCT #3782-911358-11007 / FEB 05 BILLING        | 0000-Balance Sheet     |
| 558  | 701620      | 1.1  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 27-Feb-04 | 36       | Currency | \$36.00             | LINE5 558-561PHOENIX FIELD TRIP                             | 8220-Modesto Dom Water |
| 559  | 701620      | 1.1  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 27-Feb-04 | 98.6     | Currency | \$98.60             | FIVE STAR PARK00100107 25-FEB-04                            | 8220-Modesto Dom Water |
| 560  | 701620      | 1.1  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 27-Feb-04 | 98.6     | Currency | \$98.60             | AMERISUITES TEMPE 25-FEB-04                                 | 8220-Modesto Dom Water |
| 561  | 701620      | 1.1  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 27-Feb-04 | 98.6     | Currency | \$98.60             | AMERISUITES TEMPE 25-FEB-04                                 | 8220-Modesto Dom Water |
| 562  | 701620      | 1.0  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 01-Oct-04 | 104.47   | Currency | \$104.47            | PICCADILLY DELI 25-SEP-04                                   | 8220-Modesto Dom Water |
| 563  | 701620      | 1.0  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 20-Oct-04 | 45.38    | Currency | \$45.38             | PICCADILLY DELI 18-OCT-04                                   | 8220-Modesto Dom Water |
| 564  | 701620      | 1.0  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 16-Dec-04 | 23.01    | Currency | \$23.01             | SMART & FINAL CO. SCL 14-DEC-04                             | 8220-Modesto Dom Water |
| 565  | 701620      | 1.1  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 21-Feb-05 | 91.19    | Currency | \$91.19             | LINE5 565-570 SALT LAKE CITY FIELD TRIP                     | 8220-Modesto Dom Water |
| 566  | 701620      | 1.1  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 21-Feb-05 | 19.46    | Currency | \$19.46             | LITTLE AMERICA SLC LOD 19-FEB-05                            | 8220-Modesto Dom Water |
| 567  | 701620      | 1.1  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 21-Feb-05 | 24       | Currency | \$24.00             | HMSHOT-SMF-AIR #01 17-FEB-05                                | 8220-Modesto Dom Water |
| 568  | 701620      | 1.0  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 21-Feb-05 | 10.76    | Currency | \$10.76             | SACRAMENTO CNTY ARPRIT 18-FEB-05                            | 8220-Modesto Dom Water |
| 569  | 701620      | 1.0  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 21-Feb-05 | 20.27    | Currency | \$20.27             | LITTLE AMERICA SLC LOD 19-FEB-05                            | 8220-Modesto Dom Water |
| 570  | 701620      | 1.0  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 21-Feb-05 | 182.38   | Currency | \$182.38            | SQUATTERS AIRPORT PUB 18-FEB-05                             | 8220-Modesto Dom Water |
| 571  | 701620      | 1.1  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 28-Feb-05 | 67.74    | Currency | \$67.74             | LITTLE AMERICA SLC LOD 19-FEB-05                            | 8220-Modesto Dom Water |
| 572  | 701620      | 1.0  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 02-Mar-05 | 211.81   | Currency | \$211.81            | HOUSE ON BEEF 24-FEB-05-SG CITY WTP TOUR                    | 8220-Modesto Dom Water |
| 573  | 701620      | 1.0  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 11-Mar-05 | 11.53    | Currency | \$11.53             | MEMBRANE CONFERENCE-PAT RYAN                                | 8220-Modesto Dom Water |
| 574  | 701620      | 1.0  | BANK ONE NA               | 503-Meals/Lodg/Park/RentCar                            | 11-Mar-05 | 468.53   | Currency | \$468.53            | WYNDHAM HOTELS PHOENIX 01-MAR-05                            | 8220-Modesto Dom Water |
|      |             |      |                           | <b>Total Bank One Meals/Lodg/Park/RentCar</b>          |           |          |          | <b>\$1,927.09</b>   |   |                        |
| 575  | 701620      | 1.0  | DIAS, GREGORY PAUL (GREG) | 503-Meals/Lodg/Park/RentCar                            | 16-Dec-04 | 20       | Currency | \$20.00             | EXPENSES - PBLIC MTG PHASE TWO EXPANSION PROJECT PUBLIC MTG | 0000-Balance Sheet     |
|      |             |      |                           | <b>Total Greg Dias Meals/Lodg/Park/RentCar</b>         |           |          |          | <b>\$20.00</b>      |   |                        |

| Line No. | Project | Task | Employee/Supplier                   | Expend Type                               | Item Date | Quantity | UOM      | Burdened Cost | Comment  | Expend Org             |
|----------|---------|------|-------------------------------------|---|-----------|----------|----------|---------------|--|------------------------|
| 576      | 701620  | 1.0  | JAKE SONKE, CONTROLLER              | 503-Meals/Lodg/Park/Rent/Car              | 20-Jun-03 | 7.55     | Currency | \$7.55        | CASH AND CARRY / PURCHASES - W.E. 6/20/03 - REIMBURSE THE PETTY CASH ACCT FOR MONEY ISSUED                     | 0000-Balance Sheet     |
| 577      | 701620  | 1.0  | JAKE SONKE, CONTROLLER              | 503-Meals/Lodg/Park/Rent/Car              | 27-Jun-03 | 33.12    | Currency | \$33.12       | CASH HAND CARRY  | 0000-Balance Sheet     |
| 578      | 701620  | 1.0  | JAKE SONKE, CONTROLLER              | 503-Meals/Lodg/Park/Rent/Car              | 22-Jul-03 | 11.2     | Currency | \$11.20       | OLDE TYME PASTRY / PURCHASES THRU 7/21/03 - REIMBURSE THE PETTY CASH ACCT                                      | 0000-Balance Sheet     |
| 579      | 701620  | 1.0  | JAKE SONKE, CONTROLLER              | 503-Meals/Lodg/Park/Rent/Car              | 11-Mar-04 | 11       | Currency | \$11.00       | CITY OF SACRAMENTO - PARKING / PURCHASES W.E. 3/10/04 - MEETING WITH SWRCB                                     | 0000-Balance Sheet     |
| 580      | 701620  | 1.0  | JAKE SONKE, CONTROLLER              | 503-Meals/Lodg/Park/Rent/Car              | 28-Sep-04 | 7.8      | Currency | \$7.80        | CASH & CARRY / PURCHASES - W.E. 9/27/04 / REIMBURSE THE PETTY CASH FOR FUNDS ISSUED                            | 0000-Balance Sheet     |
| 581      | 701620  | 1.0  | JAKE SONKE, CONTROLLER              | 503-Meals/Lodg/Park/Rent/Car              | 19-Oct-04 | 6.49     | Currency | \$6.49        | CASH & CARRY / PURCHASES / W.E. 10/19/04 / REIMBURSE THE PETTY CASH FOR FUNDS ISSUED                           | 0000-Balance Sheet     |
| 582      | 701620  | 1.0  | JAKE SONKE, CONTROLLER              | 503-Meals/Lodg/Park/Rent/Car              | 17-Dec-04 | 14.97    | Currency | \$14.97       | SAVEMART / PURCHASES W.E. 12/16/04 / REPLENISH THE PETTY CASH ACCT FOR FUNDS ISSUED                            | 0000-Balance Sheet     |
| 583      | 701620  | 1.0  | RYAN, PATRICK J. (PAT)              | Total Petty Cash Meals/Lodg/Park/Rent/Car | 18-Mar-05 | 49.5     | Currency | \$92.13       | REIMB EXP / MEMBRANE TECH CONF IN PHOENIX, AZ 3/9/05   | 0000-Balance Sheet     |
| 584      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)            | Total Pat Ryan Meals/Lodg/Park/Rent/Car   | 18-Mar-05 | 49.5     | Currency | \$49.50       | MRWTP PHASE II PROJECT LUNCH MTG / FEB 18,   | 0000-Balance Sheet     |
| 585      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)            | 503-Meals/Lodg/Park/Rent/Car              | 28-Feb-04 | 60       | Currency | \$60.00       | 2004   | 0000-Balance Sheet     |
| 586      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)            | 503-Meals/Lodg/Park/Rent/Car              | 09-Mar-04 | 75       | Currency | \$75.00       | 3/2/04 SWRCB MTG   | 0000-Balance Sheet     |
| 587      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)            | 503-Meals/Lodg/Park/Rent/Car              | 12-May-04 | 52       | Currency | \$52.00       | LUNCH STRATEGY MTG 5/3/04  | 0000-Balance Sheet     |
| 588      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)            | 503-Meals/Lodg/Park/Rent/Car              | 19-May-04 | 110      | Currency | \$110.00      | OC WTP TOUR / WBLACK & VEATCH & US FILTER, EXPENSES - PBLIC MTG PHASE TWO EXPANSION PROJECT MTG                | 0000-Balance Sheet     |
| 589      | 701620  | 1.0  | WARD, WALTER PAUL (WALT)            | 503-Meals/Lodg/Park/Rent/Car              | 17-Dec-04 | 90       | Currency | \$90.00       |  | 0000-Balance Sheet     |
| 590      |         |      |                                     | Total Meals/Lodger/Park/RentalCars        |           |          |          | \$387.00      |  |                        |
| 591      |         |      |                                     |   |           |          |          |               |  |                        |
| 592      | 701620  | 1.1  | BANK ONE, NA                        | 504-Seminars/Training/Meetings            | 02-Feb-05 | 675      | Currency | \$675.00      | AMERICAN WATER WORKS 27-JAN-05 (MEMBRANE CONF.)  | 8220-Modesto Dom Water |
| 593      |         |      |                                     |   |           |          |          |               |  |                        |
| 594      | 701620  | 1.1  | BANK ONE, NA                        | 504-Seminars/Training/Meetings            | 17-Feb-05 | 200      | Currency | \$200.00      | AMER WATER WORKS LB 15-FEB-05 (MEMBRANE CONF.)   | 8220-Modesto Dom Water |
| 595      |         |      |                                     |   |           |          |          |               |  |                        |
| 596      |         |      |                                     | Total Seminars/Training/Meetings          |           |          |          |               |  |                        |
| 597      |         |      |                                     |   |           |          |          |               |  |                        |
| 598      | 701620  | 1.1  | IEL SOL                             | 601-Advertising                           | 01-Feb-04 | 172.5    | Currency | \$172.50      | PO 44568 / JAN 03 BILLING  | 0000-Balance Sheet     |
| 599      | 701620  | 1.0  | IEL SOL                             | 601-Advertising                           | 01-Mar-04 | 172.5    | Currency | \$172.50      | PO 44568 / FEB 04 ADS  | 0000-Balance Sheet     |
| 600      | 701620  | 1.0  | IEL SOL                             | 601-Advertising                           | 01-Dec-04 | 205.8    | Currency | \$205.80      | ACCT 900000005   | 0000-Balance Sheet     |
| 601      | 701620  | 1.0  | IEL SOL                             | 601-Advertising                           | 28-Dec-04 | 179.9    | Currency | \$179.90      | PO 44568   | 0000-Balance Sheet     |
| 602      | 701620  | 1.0  | MODESTO BEE                         | 601-Advertising                           | 01-Feb-04 | 1726.73  | Currency | \$1,726.73    | ADVERTISING 1/31 & 2/1/04 / WATER FACILITIES   | 0000-Balance Sheet     |
| 603      | 701620  | 1.0  | MODESTO BEE                         | 601-Advertising                           | 01-Mar-04 | 1547.04  | Currency | \$1,547.04    | ACCT 40061705 / VARIOUS ADS 2/2/04-2/29/04   | 0000-Balance Sheet     |
| 604      | 701620  | 1.0  | MODESTO BEE                         | 601-Advertising                           | 28-Nov-04 | 1843.2   | Currency | \$1,843.20    | PO 44564 / 11/7-11/21/04 NOA-WATER   | 0000-Balance Sheet     |
| 605      | 701620  | 1.0  | MODESTO BEE                         | 601-Advertising                           | 26-Dec-04 | 2281.38  | Currency | \$2,281.38    | PO 44564 / ACCT 40061705 / 11/29/04-12/26/04   | 0000-Balance Sheet     |
| 606      | 701620  | 1.0  | STANISLAUS FARM NEWS                | 601-Advertising                           | 01-Feb-04 | 50       | Currency | \$50.00       | PO 44568 / DISPLAY ADS   | 0000-Balance Sheet     |
| 607      | 701620  | 1.0  | STANISLAUS FARM NEWS                | 601-Advertising                           | 01-Mar-04 | 50       | Currency | \$50.00       | PO 44568 / FEB 04 / WATER FAC PHASE 2  | 0000-Balance Sheet     |
| 608      | 701620  | 1.0  | WATERFORD NEWS                      | 601-Advertising                           | 09-Feb-04 | 179.25   | Currency | \$179.25      | AD 2/3/04 / WATER FACILITIES EXPANSION   | 0000-Balance Sheet     |
| 609      | 701620  | 1.1  | WATERFORD NEWS                      | 601-Advertising                           | 10-Dec-04 | 358.5    | Currency | \$358.50      | PO 44557 / W.E. 12/10/04 ADS   | 0000-Balance Sheet     |
| 610      | 701620  | 1.0  | WATERFORD NEWS                      | 601-Advertising                           | 17-Dec-04 | 358.5    | Currency | \$358.50      | PO 44557 / W.E. 12/15/04 BILLING / PUBLIC MTGS   | 0000-Balance Sheet     |
| 611      |         |      |                                     | Total Advertising                         |           |          |          |               |  |                        |
| 612      |         |      |                                     |   |           |          |          |               |  |                        |
| 613      |         |      |                                     |   |           |          |          |               |  |                        |
| 614      | 701620  | 1.0  | STATE WATER RESOURCES CONTROL BOARD | 612-Permits                               | 31-Dec-03 | 900      | Currency | \$900.00      | ADDTL FILING FEE FOR LONG TERM WATER TRANSFER TO THE CITY OF MODESTO / RECENT ADOPTED FEE SCHEDULE WAS CHANGED | 0000-Balance Sheet     |
| 615      | 701620  | 1.0  | JAKE SONKE, CONTROLLER              | 621-Publications/Subscriptions            | 15-Jun-04 | 10.73    | Currency | \$10.73       | PURCHASES W.E. 6/14/04 / REIMBURSE THE PETTY CASH FOR FUNDS ISSUED-Videos City Council Meeting                 | 0000-Balance Sheet     |
|          |         |      |                                     | Total Misc. Expenses                      |           |          |          |               |  |                        |

|                                     |              |       |
|-------------------------------------|--------------|-------|
| Labor                               | \$420,980.58 | 32.5% |
| Consultants/Outside Services        | \$845,089.31 | 65.2% |
| Meals/Lodging/Parking/Rent/Car      | \$2,475.72   | 0.2%  |
| Transportation                      | \$2,666.26   | 0.2%  |
| Materials, Postage, Parts, Supplies | \$13,338.60  | 1.0%  |
| Seminars/Training/Meetings          | \$875.00     | 0.1%  |
| Advertising                         | \$9,125.10   | 0.7%  |
| Misc. Expenses                      | \$910.73     | 0.1%  |

check sum \$1,295,461.30 100.0%

OK

\$450,371.99

## PHASE TWO DOMESTIC WATER EXPANSION PROJECT-COSTS FRONTED BY MID EXPENDITURES- MAY 29, 2005 THROUGH OCTOBER 1, 2005

| Project  | Task | Expend Type | Item Date | Employee/Supplier                    | Quantity | UOM   | Project Burdened Comment | Expend Org             |
|--|------|-------------|-----------|--------------------------------------|----------|-------|--------------------------|------------------------|
| <b>Total From 6-1-05 Report (Expenditures through May 28 2005)</b> |      |             |           |                                      |          |       |                          |                        |
| 701620   | 01.0 |             | 11-Jun-05 | DIAS, GREGORY PAUL (GREG)            | 46       | Hours | \$4,511.17               | 8420-Civil Engineering |
| 701620   | 01.0 |             | 25-Jun-05 | DIAS, GREGORY PAUL (GREG)            | 50       | Hours | \$4,903.44               | 8420-Civil Engineering |
| 701620   | 01.0 |             | 9-Jul-05  | DIAS, GREGORY PAUL (GREG)            | 51       | Hours | \$5,001.51               | 8420-Civil Engineering |
| 701620   | 01.0 |             | 23-Jul-05 | DIAS, GREGORY PAUL (GREG)            | 34       | Hours | \$3,334.34               | 8420-Civil Engineering |
| 701620   | 01.0 |             | 6-Aug-05  | DIAS, GREGORY PAUL (GREG)            | 36       | Hours | \$3,530.48               | 8420-Civil Engineering |
| 701620   | 01.0 |             | 20-Aug-05 | DIAS, GREGORY PAUL (GREG)            | 24       | Hours | \$2,353.65               | 8420-Civil Engineering |
| 701620   | 01.0 |             | 3-Sep-05  | DIAS, GREGORY PAUL (GREG)            | 58       | Hours | \$5,688.00               | 8420-Civil Engineering |
|  |      |             |           | <b>Total Greg Dias Labor</b>         |          |       | <b>\$29,322.59</b>       |                        |
| 701620   | 01.1 |             | 20-Aug-05 | DURRER, CHARLES L (CHUCK)            | 20       | Hours | \$912.12                 | 8220-Modesto Dom Water |
|  |      |             |           | <b>Total Charles Durrer Labor</b>    |          |       | <b>\$912.12</b>          |                        |
| 701620   | 01.1 |             | 9-Jul-05  | EDWARDS, KENNETH W (KEN)             | 15       | Hours | \$1,366.11               | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 23-Jul-05 | EDWARDS, KENNETH W (KEN)             | 10       | Hours | \$910.74                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 6-Aug-05  | EDWARDS, KENNETH W (KEN)             | 25       | Hours | \$2,276.85               | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 20-Aug-05 | EDWARDS, KENNETH W (KEN)             | 20       | Hours | \$1,821.48               | 8220-Modesto Dom Water |
|  |      |             |           | <b>Total Ken Edwards Labor</b>       |          |       | <b>\$6,375.18</b>        |                        |
| 701620   | 01.1 |             | 23-Jul-05 | EICHMAN, MARK A (MARK)               | 8        | Hours | \$412.90                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 6-Aug-05  | EICHMAN, MARK A (MARK)               | 20       | Hours | \$1,032.26               | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 20-Aug-05 | EICHMAN, MARK A (MARK)               | 26       | Hours | \$1,290.33               | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 3-Sep-05  | EICHMAN, MARK A (MARK)               | 8        | Hours | \$412.90                 | 8220-Modesto Dom Water |
|  |      |             |           | <b>Total Mark Eichman Labor</b>      |          |       | <b>\$3,148.39</b>        |                        |
| 701620   | 01.1 |             | 11-Jun-05 | HIDAHIL, CLAUDIA LOUISE (CLAUDIA)    | 3        | Hours | \$235.56                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 25-Jun-05 | HIDAHIL, CLAUDIA LOUISE (CLAUDIA)    | 8        | Hours | \$628.21                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 9-Jul-05  | HIDAHIL, CLAUDIA LOUISE (CLAUDIA)    | 8        | Hours | \$628.21                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 23-Jul-05 | HIDAHIL, CLAUDIA LOUISE (CLAUDIA)    | 5        | Hours | \$392.63                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 6-Aug-05  | HIDAHIL, CLAUDIA LOUISE (CLAUDIA)    | 12       | Hours | \$942.31                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 20-Aug-05 | HIDAHIL, CLAUDIA LOUISE (CLAUDIA)    | 25       | Hours | \$2,062.45               | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 3-Sep-05  | HIDAHIL, CLAUDIA LOUISE (CLAUDIA)    | 28       | Hours | \$2,309.94               | 8220-Modesto Dom Water |
|  |      |             |           | <b>Total Claudia Hidahl Labor</b>    |          |       | <b>\$7,199.33</b>        |                        |
| 701620   | 01.0 |             | 11-Jun-05 | KETSCHER, WILLIAM M (BILL)           | 4        | Hours | \$454.95                 | 8420-Civil Engineering |
| 701620   | 01.0 |             | 25-Jun-05 | KETSCHER, WILLIAM M (BILL)           | 8        | Hours | \$909.91                 | 8420-Civil Engineering |
| 701620   | 01.0 |             | 9-Jul-05  | KETSCHER, WILLIAM M (BILL)           | 10       | Hours | \$1,137.39               | 8420-Civil Engineering |
| 701620   | 01.0 |             | 23-Jul-05 | KETSCHER, WILLIAM M (BILL)           | 10       | Hours | \$1,137.39               | 8420-Civil Engineering |
| 701620   | 01.0 |             | 6-Aug-05  | KETSCHER, WILLIAM M (BILL)           | 12       | Hours | \$1,364.86               | 8420-Civil Engineering |
| 701620   | 01.0 |             | 20-Aug-05 | KETSCHER, WILLIAM M (BILL)           | 8        | Hours | \$909.91                 | 8420-Civil Engineering |
| 701620   | 01.0 |             | 3-Sep-05  | KETSCHER, WILLIAM M (BILL)           | 6        | Hours | \$682.43                 | 8420-Civil Engineering |
|  |      |             |           | <b>Total Bill Ketscher Labor</b>     |          |       | <b>\$6,596.84</b>        |                        |
| 701620   | 01.1 |             | 9-Jul-05  | MASON, JOSEPH EDWARD (JOE)           | 4        | Hours | \$206.45                 | 8220-Modesto Dom Water |
| 701620   | 01.0 |             | 23-Jul-05 | MASON, JOSEPH EDWARD (JOE)           | 2        | Hours | \$103.23                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 6-Aug-05  | MASON, JOSEPH EDWARD (JOE)           | 8        | Hours | \$412.90                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 20-Aug-05 | MASON, JOSEPH EDWARD (JOE)           | 20       | Hours | \$1,032.26               | 8220-Modesto Dom Water |
|  |      |             |           | <b>Total Joe Mason Labor</b>         |          |       | <b>\$1,754.84</b>        |                        |
| 701620   | 01.0 |             | 6-Aug-05  | MAZAREGOS, LEISSER PATRICIA (LEISSI) | 42       | Hours | \$1,424.14               | 8420-Civil Engineering |
|  |      |             |           | <b>Total Leisser Mazaregos Labor</b> |          |       | <b>\$1,424.14</b>        |                        |
| 701620   | 01.1 |             | 9-Jul-05  | MILLER, JEFFERY LEE (JEFF)           | 50       | Hours | \$3,556.80               | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 9-Jul-05  | MILLER, JEFFERY LEE (JEFF)           | -50      | Hours | -\$3,556.80              | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 9-Jul-05  | MILLER, JEFFERY LEE (JEFF)           | 42       | Hours | \$2,987.71               | 8220-Modesto Dom Water |
| 701620   | 01.1 | P12         | 9-Jul-05  | MILLER, JEFFERY LEE (JEFF)           | 0        | Hours | \$106.70                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 9-Jul-05  | MILLER, JEFFERY LEE (JEFF)           | 3        | Hours | \$213.41                 | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 23-Jul-05 | MILLER, JEFFERY LEE (JEFF)           | 30       | Hours | \$2,134.08               | 8220-Modesto Dom Water |
| 701620   | 01.1 |             | 20-Aug-05 | MILLER, JEFFERY LEE (JEFF)           | 16       | Hours | \$1,138.18               | 8220-Modesto Dom Water |
|  |      |             |           | <b>Total Jeff Miller Labor</b>       |          |       | <b>\$6,580.08</b>        |                        |
| 701620   | 01.0 |             | 6-Aug-05  | RATTO, VALERIE I (VALERIE)           | 1        | Hours | \$33.91                  | 8420-Civil Engineering |
|  |      |             |           | <b>Total Valerie Ratto Labor</b>     |          |       | <b>\$33.91</b>           |                        |
| 701620   | 01.0 |             | 11-Jun-05 | RYAN, PATRICK J (PAT)                | 8        | Hours | \$844.94                 | 8220-Modesto Dom Water |
| 701620   | 01.0 |             | 25-Jun-05 | RYAN, PATRICK J (PAT)                | 19       | Hours | \$2,006.73               | 8220-Modesto Dom Water |

|        |      |                            |   |                   |   |                           |
|--------|------|----------------------------|---|-------------------|---|---------------------------|
| 701620 | 01.0 | 1                          | 23-Jul-05 RYAN, PATRICK J (PAT)                       | 17 Hours          | \$1,795.49  | 8220-Modesto Dom Water    |
| 701620 | 01.0 | 1                          | 6-Aug-05 RYAN, PATRICK J (PAT)                        | 15 Hours          | \$1,584.26  | 8220-Modesto Dom Water    |
| 701620 | 01.0 | 1                          | 20-Aug-05 RYAN, PATRICK J (PAT)                       | 15 Hours          | \$1,584.26  | 8220-Modesto Dom Water    |
| 701620 | 01.0 | 1                          | 3-Sep-05 RYAN, PATRICK J (PAT)                        | 53 Hours          | \$5,597.71  | 8220-Modesto Dom Water    |
|        |      |                            | <b>Total Pat Ryan Labor</b>                           |                   | <b>\$13,413.39</b>  |                           |
| 701620 | 01.0 | 1                          | 11-Jun-05 WARD, WALTER PAUL (WALT)                    | 2.5 Hours         | \$314.68  | 8010-AGM-Water Operations |
| 701620 | 01.0 | 1                          | 25-Jun-05 WARD, WALTER PAUL (WALT)                    | 6 Hours           | \$755.23  | 8010-AGM-Water Operations |
| 701620 | 01.0 | 1                          | 23-Jul-05 WARD, WALTER PAUL (WALT)                    | 2 Hours           | \$251.74  | 8010-AGM-Water Operations |
| 701620 | 01.0 | 1                          | 6-Aug-05 WARD, WALTER PAUL (WALT)                     | 4 Hours           | \$503.48  | 8010-AGM-Water Operations |
| 701620 | 01.0 | 1                          | 20-Aug-05 WARD, WALTER PAUL (WALT)                    | 8 Hours           | \$1,006.97  | 8010-AGM-Water Operations |
| 701620 | 01.0 | 1                          | 3-Sep-05 WARD, WALTER PAUL (WALT)                     | 8 Hours           | \$1,006.97  | 8010-AGM-Water Operations |
|        |      |                            | <b>Total Walter Ward Labor</b>                        |                   | <b>\$3,639.07</b>   |                           |
|        |      |                            | <b>Total Labor</b>                                    |                   | <b>\$80,599.88</b>  |                           |
| 701620 | 01.1 | 201-Materials              | 7-Jul-05 CENTER STATE PIPE & SUPPLY                   | 59.98 Currency    | \$59.98 PO 44100  | 0000-Balance Sheet        |
| 701620 | 01.1 | 255-Material Sales Tax     | 7-Jul-05 CENTER STATE PIPE & SUPPLY                   | 4.42 Currency     | \$4.42 PO 44100   | 0000-Balance Sheet        |
|        |      |                            | <b>Total Center State Pipe &amp; Supply Materials</b> |                   | <b>\$64.41</b>  |                           |
| 701620 | 01.1 | 201-Materials              | 1-Jul-05 DELTA RUBBER                                 | 835.61 Currency   | \$835.61 PO 42750   | 0000-Balance Sheet        |
| 701620 | 01.1 | 201-Materials              | 8-Jul-05 DELTA RUBBER                                 | 111.84 Currency   | \$111.84 PO 42750   | 0000-Balance Sheet        |
| 701620 | 01.1 | 201-Materials              | 1-Sep-05 DELTA RUBBER                                 | 285.94 Currency   | \$285.94 PO 42750   | 0000-Balance Sheet        |
| 701620 | 01.1 | 255-Material Sales Tax     | 1-Jul-05 DELTA RUBBER                                 | 61.67 Currency    | \$61.67 PO 42750  | 0000-Balance Sheet        |
| 701620 | 01.1 | 255-Material Sales Tax     | 8-Jul-05 DELTA RUBBER                                 | 8.25 Currency     | \$8.25 PO 42750   | 0000-Balance Sheet        |
| 701620 | 01.1 | 255-Material Sales Tax     | 1-Sep-05 DELTA RUBBER                                 | 21.1 Currency     | \$21.10 PO 42750  | 0000-Balance Sheet        |
|        |      |                            | <b>Total Delta Rubber Materials</b>                   |                   | <b>\$1,324.41</b>   |                           |
| 701620 | 01.1 | 201-Materials              | 10-Aug-05 WATERFORD FARM SUPPLY                       | 15.76 Currency    | \$15.76 PO 43010  | 0000-Balance Sheet        |
| 701620 | 01.1 | 255-Material Sales Tax     | 10-Aug-05 WATERFORD FARM SUPPLY                       | 1.16 Currency     | \$1.16 PO 43010   | 0000-Balance Sheet        |
|        |      |                            | <b>Total Waterford Farm Supply Materials</b>          |                   | <b>\$16.92</b>  |                           |
| 701620 | 01.1 | 207-Freight                | 4-Jul-05 BANK ONE, NA                                 | 62.66 Currency    | \$62.66 FEDEX FREIGHT WEST INC 30-JUN-05  | 8220-Modesto Dom Water    |
|        |      |                            | <b>Total Bank One Freight</b>                         |                   | <b>\$62.66</b>  |                           |
| 701620 | 01.1 | 214-Repair Parts           | 29-Jun-05 BANK ONE, NA                                | 264.89 Currency   | \$264.89 MICMASTER-CARR 27-JUN-05   | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 29-Jun-05 BANK ONE, NA                                | 388.38 Currency   | \$388.38 MICMASTER-CARR 27-JUN-05   | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 30-Jun-05 BANK ONE, NA                                | 416.61 Currency   | \$416.61 MICMASTER-CARR 28-JUN-05   | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 1-Jul-05 BANK ONE, NA                                 | 43.8 Currency     | \$43.80 MICMASTER-CARR 29-JUN-05  | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 1-Jul-05 BANK ONE, NA                                 | 483.51 Currency   | \$483.51 MICMASTER-CARR 29-JUN-05   | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 1-Jul-05 BANK ONE, NA                                 | 244.55 Currency   | \$244.55 MICMASTER-CARR 05-JUL-05   | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 7-Jul-05 BANK ONE, NA                                 | 100.38 Currency   | \$100.38 MICMASTER-CARR 13-JUL-05   | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 18-Jul-05 BANK ONE, NA                                | 114.57 Currency   | \$114.57 MICMASTER-CARR 14-JUL-05   | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 18-Jul-05 BANK ONE, NA                                | 1336.96 Currency  | \$1,336.96 MICMASTER-CARR 13-JUL-05   | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 28-Jul-05 BANK ONE, NA                                | 74.53 Currency    | \$74.53 MICMASTER-CARR 26-JUL-05  | 8220-Modesto Dom Water    |
| 701620 | 01.1 | 214-Repair Parts           | 29-Jul-05 BANK ONE, NA                                | 230.84 Currency   | \$230.84 MICMASTER-CARR 27-JUL-05   | 8220-Modesto Dom Water    |
|        |      |                            | <b>Total Bank One Repair Parts</b>                    |                   | <b>\$3,751.08</b>   |                           |
|        |      |                            | <b>Total Materials and Supplies</b>                   |                   | <b>\$5,219.48</b>   |                           |
| 701620 | 01.1 | 401-Consulting             | 1-Jun-05 BLACK & VEATCH                               | 16841.86 Currency | \$16,841.86 CLIENT 66518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 3/5/05-4/7/05                 | 0000-Balance Sheet        |
| 701620 | 01.1 | 401-Consulting             | 22-Jun-05 BLACK & VEATCH                              | 34983.76 Currency | \$34,983.76 CLIENT 66518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 4/2/05-6/3/05                 | 0000-Balance Sheet        |
| 701620 | 01.1 | 401-Consulting             | 15-Jul-05 BLACK & VEATCH                              | 18137.81 Currency | \$18,137.81 CLIENT 66518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 6/4/05-6/30/05                | 0000-Balance Sheet        |
| 701620 | 01.1 | 401-Consulting             | 1-Sep-05 BLACK & VEATCH                               | 47247.97 Currency | \$47,247.97 PROFESSIONAL SERVICES - JUL 05 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR   | 0000-Balance Sheet        |
|        |      |                            | <b>Total Black &amp; Veatch Consulting</b>            |                   | <b>\$117,211.40</b>   |                           |
| 701620 | 01.1 | 401-Consulting             | 6-Jun-05 JONES & STOKES ASSOCIATES                    | 2100.15 Currency  | \$2,100.15 PROFESSIONAL SERVICES / MAY 05 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR    | 0000-Balance Sheet        |
| 701620 | 01.1 | 401-Consulting             | 7-Jul-05 JONES & STOKES ASSOCIATES                    | 7475.79 Currency  | \$7,475.79 PROJ 03664.03 / PROF SVCS - 9/23/05-6/26/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR | 0000-Balance Sheet        |
| 701620 | 01.1 | 401-Consulting             | 1-Aug-05 JONES & STOKES ASSOCIATES                    | 4260.25 Currency  | \$4,260.25 PROFESSIONAL SERVICES - MRWTP PHASE TWO EXPANSION PROJECT SEIR / JUL 05 BILLING    | 0000-Balance Sheet        |
| 701620 | 01.1 | 401-Consulting             | 1-Sep-05 JONES & STOKES ASSOCIATES                    | 786.1 Currency    | \$786.10 PROFESSIONAL SERVICES - JUL 05 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR      | 0000-Balance Sheet        |
|        |      |                            | <b>Total Jones &amp; Stokes Consulting</b>            |                   | <b>\$14,622.29</b>  |                           |
| 701620 | 01.1 | 425-Other Outside Services | 30-May-05 BSK ANALYTICAL LABORATORIES                 | 1350 Currency     | \$1,350.00 PO 41760   | 0000-Balance Sheet        |
| 701620 | 01.1 | 425-Other Outside Services | 2-Jun-05 BSK ANALYTICAL LABORATORIES                  | 185 Currency      | \$185.00 PO 41760   | 0000-Balance Sheet        |
| 701620 | 01.1 | 425-Other Outside Services | 8-Jun-05 BSK ANALYTICAL LABORATORIES                  | 240 Currency      | \$240.00 PO 41760   | 0000-Balance Sheet        |
| 701620 | 01.1 | 425-Other Outside Services | 15-Jun-05 BSK ANALYTICAL LABORATORIES                 | 2025 Currency     | \$2,025.00 PO 41760   | 0000-Balance Sheet        |

|        |  |  |                 |   |                        |
|--------|--|--|-----------------|---|------------------------|
| 701620 | 01.1 425-Other Outside Services                | 17-Jun-05 BSK ANALYTICAL LABORATORIES            | 365 Currency    | \$365.00 PO 41760                                     | 0000-Balance Sheet     |
| 701620 | 01.1 425-Other Outside Services                | 21-Jun-05 BSK ANALYTICAL LABORATORIES            | 495 Currency    | \$495.00 PO 41760                                     | 0000-Balance Sheet     |
| 701620 | 01.1 425-Other Outside Services                | 21-Jun-05 BSK ANALYTICAL LABORATORIES            | 150 Currency    | \$150.00 PO 41760                                     | 0000-Balance Sheet     |
| 701620 | 01.1 425-Other Outside Services                | 21-Jun-05 BSK ANALYTICAL LABORATORIES            | 185 Currency    | \$185.00 PO 41760                                     | 0000-Balance Sheet     |
| 701620 | 01.1 425-Other Outside Services                | 23-Jun-05 BSK ANALYTICAL LABORATORIES            | 150 Currency    | \$150.00 PO 41760                                     | 0000-Balance Sheet     |
| 701620 | 01.1 425-Other Outside Services                | 30-Jun-05 BSK ANALYTICAL LABORATORIES            | 150 Currency    | \$150.00 PO 41760                                     | 0000-Balance Sheet     |
| 701620 | 01.1 425-Other Outside Services                | 13-Jul-05 BSK ANALYTICAL LABORATORIES            | 150 Currency    | \$150.00 PO 41760                                     | 0000-Balance Sheet     |
| 701620 | 01.1 425-Other Outside Services                | 8-Aug-05 BSK ANALYTICAL LABORATORIES             | 30 Currency     | \$30.00 PO 41760                                      | 0000-Balance Sheet     |
| 701620 | 01.1 425-Other Outside Services                | 8-Aug-05 BSK ANALYTICAL LABORATORIES             | 375 Currency    | \$375.00 PO 41760                                     | 0000-Balance Sheet     |
|        | <b>Total Consulting &amp; Outside Services</b> | <b>Total BSK Analytical Lab Outside Services</b> |                 | <b>\$5,850.00</b>                                     |                        |
|        |  |  |                 | <b>\$137,663.69</b>                                   |                        |
| 701620 | 01.1 503-Meals/Lodg/Park/Rent/Car              | 1-Aug-05 BANK ONE, NA                            | 66.67 Currency  | \$66.67 DOUBLETREE, MODESTO F & 28-JUL-05             | 8220-Modesto Dom Water |
| 701620 | 01.0 503-Meals/Lodg/Park/Rent/Car              | 24-Jun-05 EDWARDS, KENNETH W (KEN)               | 43.56 Currency  | \$43.56 EXP REIMB / AWWA IN SF ON 6/15/05             | 0000-Balance Sheet     |
| 701620 | 01.0 503-Meals/Lodg/Park/Rent/Car              | 24-Jun-05 EICHMAN, MARK A (MARK)                 | 26.12 Currency  | \$26.12 EXP REIMB / AWWA IN SF ON 6/14/05             | 0000-Balance Sheet     |
| 701620 | 01.0 503-Meals/Lodg/Park/Rent/Car              | 6-Sep-05 JAKE SONKE, CONTROLLER                  | 4 Currency      | \$4.00 FOR FUNDS ISSUED                               | 0000-Balance Sheet     |
| 701620 | 01.1 503-Meals/Lodg/Park/Rent/Car              | 26-Jul-05 WARD, WALTER PAUL (WALT)               | 85 Currency     | \$85.00 LUNCHONEN / MODESTO , CA / JUL 25, 2005       | 0000-Balance Sheet     |
|        | <b>Total Meals/Lodg/Park/Rent/Car</b>          |  |                 | <b>\$225.35</b>                                       |                        |
| 701620 | 01.0 601-Advertising                           | 31-Jul-05 MODESTO BEE                            | 146.55 Currency | \$146.55 PO 44564 / ACCT #10133800 / JUL 05 BILLING   | 0000-Balance Sheet     |
|        | <b>Total Advertising</b>                       |  |                 | <b>\$146.55</b>                                       |                        |
| 701620 | 01.0 642-Trash Removal/Dumping Fees            | 31-Aug-05 GILTON RESOURCE RECOVERY               | 30 Currency     | \$30.00 ACCT #00000386-00 / AUG 05 BILLING / PO 44573 | 0000-Balance Sheet     |
|        | <b>Total Misc. Expenses</b>                    |  |                 | <b>\$30.00</b>  |                        |

| Task 01 Totals                      |                    |
|-------------------------------------|--------------------|
| Labor                               | \$501,580.46 33.0% |
| Consultants/Outside Services        | \$982,773.00 64.7% |
| Meals/Lodg/Parking/Rent/Car         | \$2,701.07 0.2%    |
| Transportation                      | \$2,666.26 0.2%    |
| Materials, Postage, Parts, Supplies | \$16,569.08 1.2%   |
| Seminars/Training/Meetings          | \$673.00 0.1%      |
| Advertising                         | \$2,271.05 0.2%    |
| Misc. Expenses                      | \$940.73 0.1%      |

Check sum for this report \$223,904.95  
Total from June 1 2005 report \$1,295,461.30  
**Total for All 01 Task Charges \$1,519,366.25**  
100.0%



## **APPENDIX H**

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### Groundwater Information

- Groundwater Basin Descriptions
- Discussion on Groundwater Operational Yield
- Groundwater Management Plans (Report Cover Sheets with Links)

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## San Joaquin Valley Groundwater Basin Modesto Subbasin

- Groundwater Subbasin Number: 5-22.02
- County: Stanislaus
- Surface Area: 247,000 acres (385 square miles)

### Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Modesto subbasin lies between the Stanislaus River to the north and Tuolumne River to the south and between the San Joaquin River on the west and crystalline basement rock of the Sierra Nevada foothills on the east. The northern, western, and southern boundaries are shared with the Eastern San Joaquin Valley, Delta-Mendota, and Turlock Groundwater Subbasins, respectively. The subbasin comprises land primarily in the Modesto Irrigation District (MID) and the southern two-thirds of the Oakdale Irrigation District (OID). The City of Modesto is in the southwestern portion of the subbasin. Average annual precipitation for this subbasin is 11 to 15 inches, increasing eastward.

### Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide. It is filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

### Water Bearing Formations

The primary hydrogeologic units in the Modesto Subbasin include both consolidated and unconsolidated sedimentary deposits. The consolidated deposits include the Ione Formation of Miocene age, the Valley Springs Formation of Eocene age, and the Mehrten Formation, which was deposited during the Miocene to Pliocene Epochs. The consolidated deposits lie in the eastern portion of the subbasin and generally yield small quantities of water to wells except for the Mehrten Formation, which is an important aquifer. In the Subbasin, the Mehrten Formation is composed of up to 300 feet of sandstone, breccia, conglomerate, tuff siltstone and claystone (Page 1973).

The unconsolidated deposits were laid down during the Pliocene to present and, from oldest to youngest, include continental deposits lacustrine and marsh deposits, older alluvium, younger alluvium, and flood-subbasin deposits. The continental deposits and older alluvium are the main water-yielding units in the unconsolidated deposits. The lacustrine and marsh deposits (which include the Corcoran, or "E-" Clay), and the flood-subbasin deposits yield little water to wells, and the younger alluvium in most places probably yields only moderate quantities of water to wells (Page 1973).

The continental deposits consist of poorly sorted gravel, sand, silt and clay varying in thickness from 0 to 450 feet occurring at the surface on the eastern side of the subbasin to over 400 feet deep in the western portion. These deposits are the equivalent of the North Merced Gravels and the lower Turlock Lake Formation (Davis and others 1959). The older alluvium consists of intercalated beds of gravel sand, silt and clay with some hardpan. This alluvium is up to 400 feet thick and is generally present near or at the surface of the western one-half of the subbasin. The older alluvium is largely equivalent to the Riverbank and Modesto Formations (Davis and others 1959).

Ground water occurs under unconfined, semi-confined, and confined conditions. The unconfined water body occurs in the unconsolidated deposits above and east of the Corcoran Clay, which underlies the southwestern portion of the subbasin at depths ranging from 150 to 250 feet (DWR 1981). Where clay lenses restrict the downward flow of ground water, semi-confined conditions occur. The confined water body occurs in the unconsolidated deposits below the Corcoran Clay and extends downward to the base of fresh water.

The estimated average specific yield of this subbasin is 8.8 percent (based on DWR San Joaquin District internal data and Davis and others 1959).

### ***Restrictive Structures***

Groundwater flow is primarily to the southwest, following the regional dip of basement rock and sedimentary units. The lower to middle reaches of the Stanislaus and Tuolumne Rivers in the Subbasin appear to be gaining streams with groundwater flow into both, especially the Tuolumne River (DWR 2000). No faults have been identified that affect the movement of fresh groundwater (Page and Balding 1973).

### ***Recharge Areas***

Groundwater recharge is primarily from deep percolation of applied irrigation water and canal seepage from MID and OID facilities. Seepage from Modesto Reservoir is also significant (STRGBA 1995). Lesser recharge occurs as a result of subsurface flows originating in the mountains and foothills along the east side of the subbasin, losses from minor streams, and from percolation of direct precipitation.

### ***Groundwater Level Trends***

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were

evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has declined nearly 15 feet from 1970 through 2000. The period from 1970 through 1978 showed steep declines totaling about 12 feet. The six-year period from 1978 to 1984 saw stabilization and rebound of about 7 feet. 1984 through 1995 again showed steep declines, bottoming out in 1995 at nearly 20 feet below the 1970 level. Water levels then rose about 5 feet from 1996 to 2000. Water level declines have been more severe in the eastern portion of the subbasin, but have risen faster in the eastern subbasin between 1996 and 2000 than in any other portion of the subbasin.

### ***Groundwater Storage***

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 8.8 percent and water levels collected by DWR and cooperators.

According to these calculations, the total storage capacity of this subbasin is estimated to be 6,500,000 af to a depth of 300 feet. According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 14,000,000 af to a depth of  $\leq 1000$  feet (Williamson 1989).

### ***Groundwater Budget (Type B)***

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

Natural recharge into the subbasin is estimated to be 86,000 af. Artificial recharge and subsurface inflow values are not determined. There is approximately 92,000 af of applied water recharge. Annual urban and agricultural extractions are estimated to be 81,000 and 145,000 af, respectively. There are no other extractions, and values for subsurface outflow are not determined.

### ***Groundwater Quality***

**Characterization.** The groundwater in this basin is of a calcium bicarbonate type in the eastern subbasin to a calcium-magnesium bicarbonate or calcium-sodium bicarbonate type in the western portion. TDS values range from 60 to 8,300 mg/L, with a typical range of 200 to 500 mg/L. The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 88 wells ranging from 60 to 860 mg/L, with an average value of 295 mg/L.

**Impairments.** There are areas of hard groundwater and localized areas of high chloride, boron, DBCP, nitrate, iron, and manganese. Some sodium chloride waters of high TDS values are found along the east side of the subbasin. There are also some areas of shallow groundwater in the subbasin that require dewatering wells.

## Water Quality in Public Supply Wells

| Constituent Group <sup>1</sup> | Number of wells sampled <sup>2</sup> | Number of wells with a concentration above an MCL <sup>3</sup> |
|--------------------------------|--------------------------------------|--|
| Inorganics – Primary           | 110                                  | 3  |
| Radiological                   | 109                                  | 25   |
| Nitrates                       | 114                                  | 3  |
| Pesticides                     | 117                                  | 14   |
| VOCs and SVOCs                 | 117                                  | 8  |
| Inorganics – Secondary         | 110                                  | 8  |

<sup>1</sup> A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

<sup>2</sup> Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

<sup>3</sup> Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

## Well Characteristics

| Well yields (gal/min) |                    |                        |
|-----------------------|--------------------|------------------------|
| Municipal/Irrigation  | Range: 350 – 4,500 | Average: 1,000 - 2,000 |
| Total depths (ft)     |                    |                        |
| Domestic              |                    |                        |
| Municipal/Irrigation  | Range: 50 - 500    |                        |

## Active Monitoring Data

| Agency  | Parameter                 | Number of wells /measurement frequency |
|---|---------------------------|--|
| DWR (incl. Cooperators)                               | Groundwater levels        | 230 Semi-annually                      |
| Oakdale Irrigation District                           | Drinking water parameters | 15 Monthly to every 3 years            |
| Department of Health Services (including Cooperators) | Title 22 water quality    | 209 Varies                             |

## Basin Management

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Groundwater management: The Stanislaus and Tuolumne Rivers' Groundwater Subbasin Association has developed an AB3030 ground water management plan for the individual Association members (City of Modesto, Del Este Water Company, County of Stanislaus, Oakdale I.D., City of Oakdale, City of Riverbank, and Modesto I.D.)

Conjunctive use programs, stormwater recharge subbasins, water conservation programs operated by Oakdale and Modesto I.Ds., Stanislaus County and other public entities.

### Water agencies

#### Public

Oakdale I.D., Modesto I.D.; Stanislaus and Tuolumne Rivers' Groundwater Subbasin Association; City of Oakdale; City of Riverbank

#### Private

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## References Cited

California Department of Water Resources (DWR), San Joaquin District. Unpublished Land and Water Use Data.

\_\_\_\_\_. Well completion report files.

\_\_\_\_\_. 1981. *Depth to Top of Corcoran Clay*. 1:253,440 scale map.

\_\_\_\_\_. 1995. Internal computer spreadsheet for 1990 normal computation of net water demand used in preparation of DWR Bulletin 160-93.

\_\_\_\_\_. 2000. *Spring 1999, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer*. 1:253,440 scale map sheet.

Davis, GH, Green, JH, Olmstead, SH, and Brown, DW. 1959. *Ground Water Conditions and Storage Capacity in the San Joaquin Valley, California*; US Geological Survey Water Supply Paper No. 1469, 287p.

Page, RW, and Balding, GO. 1973. *Geology and Quality of Water in the Modesto-Merced Area, San Joaquin Valley, California, with a Brief Section of Hydrology*. USGS Water-Resources Investigations 6-73, 85p.

Stanislaus and Tuolumne Rivers' Groundwater Subbasin Association (STRGBA). 1995. *Development of a Groundwater Management Plan Phase I*. Technical Memorandum. Prepared by Black & Veatch, Provost & Pritchard, and Kenneth D. Schmidt & Associates Consulting Firms.

Williamson, Alex K, Prudic, David E, and Swain, Lindsay A. 1989. *Groundwater flow in the Central Valley, California*. US Geological Survey Professional Paper 1401-D. 127 p.

## Additional References

Balding, GO, and Page, RW. 1971. Data for Wells in the Modesto-Merced Area San Joaquin Valley, California. US Geological Survey Open-File Report.

California Department of Water Resources (DWR). 1980. Bulletin 118-80, Ground Water Subbasins in California.

\_\_\_\_\_. 1994. Bulletin 160-93. California Water Plan Update, Vol. 1.

Davis, SN and Hall, FR. 1959. Water Quality of Eastern Stanislaus and North Merced Counties, California; Stanford Univ. Pubs., Geol. Sci., v. 6, no. 1. 112 p.

## **Errata**

Changes made to the basin description will be noted here.



## San Joaquin Valley Groundwater Basin Turlock Subbasin

- Groundwater Basin Number: 5-22.03
- County: Stanislaus, Merced
- Surface Area: 347,000 acres (542 square miles)

### Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Turlock Subbasin lies between the Tuolumne and Merced Rivers and is bounded on the west by the San Joaquin River and on the east by crystalline basement rock of the Sierra Nevada foothills. The northern, western, and southern boundaries are shared with the Modesto, Delta-Mendota, and Merced Groundwater Subbasins, respectively. The subbasin includes lands in the Turlock Irrigation District, the Ballico-Cortez Water District, the Eastside Water District, and a small portion of Merced I.D. Average annual precipitation is estimated as 11 to 13 inches, increasing eastward, with 15 inches in the Sierran foothills.

### Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide. It is filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes that mark the current and historic axis of surface drainage in the San Joaquin Valley.

### *Water Bearing Formations*

The primary hydrogeologic units in the Turlock Subbasin include both consolidated and unconsolidated sedimentary deposits. The consolidated deposits include the Ione Formation of Miocene age, the Valley Springs Formation of Eocene age, and the Mehrten Formation, which was deposited during the Miocene to Pliocene Epochs. The consolidated deposits lie in the eastern portion of the subbasin and generally yield small quantities of water to wells except for the Mehrten Formation, which is an important aquifer. The Mehrten Formation is composed of up to 800 feet of sandstone, breccia, conglomerate, tuff siltstone and claystone (Page 1973).

Unconsolidated deposits include continental deposits, older alluvium, younger alluvium, and flood-basin deposits. Lacustrine and marsh deposits, which constitute the Corcoran or E-clay aquitard, underlie the western half of the subbasin at depths ranging between about 50 and 200 feet (DWR 1981). The continental deposits and older alluvium are the main water-yielding units in the unconsolidated deposits. The lacustrine and marsh deposits and the flood-subbasin deposits yield little water to wells. The younger alluvium, in most places, probably yields only moderate quantities of water.

There are three ground water bodies in the Turlock Subbasin: the unconfined water body; the semi-confined and confined water body in the consolidated rocks; and the confined water body beneath the E-clay in the western Subbasin. The estimated average specific yield of the subbasin is 10.1 percent (based on DWR San Joaquin District internal data and Davis 1959).

### ***Restrictive Structures***

Groundwater flow is primarily to the southwest, following the regional dip of basement rock and sedimentary units. Based on recent groundwater measurements (DWR 2000), a paired groundwater mound and depression appear beneath the city of Turlock and to its east, respectively. The lower to middle reaches of the Tuolumne River and the reach of the San Joaquin River in the subbasin appear to be gaining streams during this period also. No faults have been identified that affect the movement of fresh groundwater (Page 1973).

### ***Groundwater Level Trends***

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average the subbasin water level has declined nearly 7 feet from 1970 through 2000. The period from 1970 through 1992 showed a generally steep decline totaling about 15 feet. Between 1992 and 1994, water levels stayed near this low level. From 1994 to 2000, the water levels rebounded about 8 feet, bringing them to approximately 7 feet below the 1970 levels. Water level declines have been more severe in the eastern portion of the subbasin after 1982. From 1970 to 1982, water level declines were more severe in the western portion of the subbasin.

### ***Groundwater Storage***

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 10.1 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 15,800,000 af to a depth of 300 feet and 30,000,000 af to the base of fresh groundwater. These same calculations give an estimate of 12,800,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995 (DWR 1995). According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 23,000,000 af to a depth of  $\leq$  1000 feet (Williamson 1989).

### **Groundwater Budget (Type B)**

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

Natural recharge of the subbasin was estimated to be 33,000 af. Artificial recharge and subsurface inflow were not determined. Applied water recharge was calculated to be 313,000 af. Annual urban extraction and annual agricultural extraction were calculated at 65,000 and 387,000 af, respectively. Other extractions and subsurface inflow were not determined.

### **Groundwater Quality**

**Characterization.** The groundwater in this subbasin is predominately of the sodium-calcium bicarbonate type, with sodium bicarbonate and sodium chloride types at the western margin and a small area in the north-central portion. TDS values range from 100 to 8,300 mg/L, with a typical range of 200 to 500 mg/L. The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 71 wells ranging from 100 to 930 mg/L, with an average value of 335 mg/L. EC values range from 168 to 1,000  $\mu$ mhos/cm, with a typical range of 244 to 707  $\mu$ mhos/cm.

**Impairments.** There are localized areas of hard groundwater, nitrate, chloride, boron, and DBCP. Some sodium chloride type water of high TDS is found along the west side of the subbasin. Two wells in the city of Turlock have been closed, one for nitrate and one for carbon tetrachloride (Dan Wilde 2001).

### **Water Quality in Public Supply Wells**

| <b>Constituent Group<sup>1</sup></b> | <b>Number of wells sampled<sup>2</sup></b> | <b>Number of wells with a concentration above an MCL<sup>3</sup></b> |
|--------------------------------------|--|--|
| Inorganics – Primary                 | 84   | 0  |
| Radiological                         | 80   | 12   |
| Nitrates                             | 90   | 8  |
| Pesticides                           | 89   | 5  |
| VOCs and SVOCs                       | 86   | 3  |
| Inorganics – Secondary               | 84   | 11   |

<sup>1</sup> A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

<sup>2</sup> Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

<sup>3</sup> Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

## Well Characteristics

| Well yields (gal/min) |  |
|-----------------------|--|
| Municipal/Irrigation  | Range: 200 – 4,500      Average: 1,000 - 2,000 |
| Total depths (ft)     |  |
| Domestic              |  |
| Municipal/Irrigation  | Range: 50 - 350                                |

## Active Monitoring Data

| Agency  | Parameter              | Number of wells /measurement frequency |
|---|------------------------|--|
| DWR (incl. Cooperators)                               | Groundwater levels     | 307 Semi-annually                      |
| Department of Health Services (including cooperators) | Title 22 water quality | 163 Varies                             |

## Basin Management

|                         |   |
|-------------------------|---|
| Groundwater management: | Turlock District has an adopted AB 3030 ground water management plan. <a href="#">Eastside WD</a> adopted its plan on September 25, 1997. |
| Water agencies          |   |
| Public                  | <a href="#">Eastside Water District</a> , Turlock Irrigation District, Ballico-Cortez Water District (inactive), Merced I.D. (portion).   |
| Private                 |   |

## References Cited

- California Department of Water Resources (DWR), San Joaquin District. Unpublished Land and Water Use Data.
- \_\_\_\_\_. 1995. Internal computer spreadsheet for 1990 normal computation of net water demand used in preparation of DWR Bulletin 160-93.
- \_\_\_\_\_. 1981. *Depth to the Top of the Corcoran Clay*. 1:253,440 scale map.
- \_\_\_\_\_. 2000. *Spring 1999, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer*. 1:253,440 scale map sheet.
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- Wilde, Dan. City of Turlock. 2001. Response to DWR questionnaire February 12.
- Williamson, Alex K., Prudic, David E., and Swain, Lindsay A. 1989. *Groundwater flow in the Central Valley, California*. US Geological Survey Professional Paper 1401-D. 127 p.

## **Additional References**

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\_\_\_\_\_. 1994. Bulletin 160-93. *California Water Plan Update, Vol. 1*.

Davis, S.N. and Hall, F.R. 1959. *Water Quality of Eastern Stanislaus and North Merced Counties, California*. Stanford Univ. Pubs., Geol. Sci., v.6, no. 1. 112 p.

## **Errata**

Updated groundwater management information and added hotlinks where applicable.  
(1/20/06)

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## **San Joaquin Valley Groundwater Basin Delta-Mendota Subbasin**

- Groundwater Subbasin Number: 5-22.07
- County: Stanislaus, Merced, Madera, Fresno
- Surface Area: 747,000 acres (1,170 square miles)

### **Basin Boundaries and Hydrology**

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Delta-Mendota subbasin is bounded on the west by the Tertiary and older marine sediments of the Coast Ranges, and on the north by the Stanislaus/San Joaquin county line. The eastern boundary follows the San Joaquin River to Township 11 S, where it jogs eastward and follows the eastern boundary of Columbia Canal company to the San Joaquin River, then follows the Chowchilla Bypass and the eastern border of Farmer's Water District. It then trends southerly through Township 14S Range 15E on the eastern side of Fresno Slough, then follows the Tranquility ID boundary to its southern extremity. Heading northward, it follows the eastern, northern, and northwestern boundary of San Joaquin Valley – Westside Groundwater Subbasin (corresponding with Westlands Water District boundaries). Average annual precipitation is nine to 11 inches, increasing northwards.

### **Hydrogeologic Information**

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

### ***Water Bearing Formations***

The geologic units that comprise the ground water reservoir in the Delta-Mendota subbasin consist of the Tulare Formation, terrace deposits, alluvium, and flood-basin deposits. The Tulare Formation is composed of beds, lenses, and tongues of clay, sand, and gravel that have been alternately deposited in oxidizing and reducing environments (Hotchkiss 1971). The Corcoran Clay Member of the formation underlies the basin at depths ranging about 100 to 500 feet and acts as a confining bed (DWR 1981).

Terrace deposits of Pleistocene age lie up to several feet higher than present streambeds. They are composed of yellow, tan, and light-to-dark brown silt, sand, and gravel with a matrix that varies from sand to clay (Hotchkiss 1971). The water table generally lies below the bottom of the terrace deposits. However, the relatively large grain size of the terrace deposits suggests their value as possible recharge sites.

Alluvium is composed of interbedded, poorly to well-sorted clay, silt, sand, and gravel and is divided based on its degree of dissection and soil formation. The flood-basin deposits are generally composed of light-to-dark brown and gray clay, silt, sand, and organic materials with locally high concentrations of salts and alkali. Stream channel deposits of coarse sand and gravel are also included.

Groundwater in the Delta-Mendota subbasin occurs in three water-bearing zones. These include the lower zone, which contains confined fresh water in the lower section of the Tulare Formation, an upper zone which contains confined, semi-confined, and unconfined water in the upper section of the Tulare Formation and younger deposits, and a shallow zone which contains unconfined water within about 25 feet of the land surface (Davis 1959).

The estimated specific yield of this subbasin is 11.8 percent (based on DWR San Joaquin District internal data and Davis 1959). Land subsidence up to about 16 feet has occurred in the southern portion of the basin due to artesian head decline (Ireland 1964).

### ***Restrictive Structures***

Groundwater flow was historically northwestward parallel to the San Joaquin River (Hotchkiss 1971). Recent data (DWR 2000) show flow to the north and eastward, toward the San Joaquin River. Based on current and historical groundwater elevation maps, groundwater barriers do not appear to exist in the subbasin.

### ***Groundwater Level Trends***

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has increased by 2.2 feet from 1970 through 2000. The period from 1970 through 1985 showed a general increase, topping out in 1985 at 7.5 feet above the 1970 water level. The nine-year period from 1985 to 1994 saw general declines in groundwater levels, reaching back down to the 1970 groundwater level in 1994. Groundwater levels rose in 1995 to about 2.2 feet above the 1970 groundwater level. Water levels fluctuated around this value until 2000.

### ***Groundwater Storage***

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 11.8 percent and water levels collected by DWR and cooperators.



According to these calculations, the total storage capacity of this subbasin is estimated to be 30,400,000 af to a depth of 300 feet and 81,800,000 af to the base of fresh groundwater. These same calculations give an estimate of 26,600,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995 (DWR 1995). According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 51,000,000 af to a depth of  $\leq 1,000$  feet (Williamson 1989).

### **Groundwater Budget (Type B)**

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

Natural recharge is estimated to be 8,000 af. Artificial recharge and subsurface inflow are not determined. Applied water recharge is approximately 74,000 af. Annual urban and agricultural extractions estimated to be 17,000 af and 491,000 af, respectively. Other extractions are approximately 3,000 af, and subsurface outflow is not determined.

### **Groundwater Quality**

**Characterization.** The groundwater in this subbasin is characterized by mixed sulfate to bicarbonate types in the northern and central portion with areas of sodium chloride and sodium sulfate waters in the central and southern portion. TDS values range from 400 to 1,600 mg/L in the northern portion of the subbasin and from 730 to 6,000 mg/L in the southern portion of the subbasin (Hotchkiss 1971). The Department of Health Services (DHS), which monitors Title 22 water quality standards, reports TDS values in 44 public supply wells to range from 210 to 1,750 mg/L, with an average value of 770 mg/L. A typical range of water quality in wells is 700-1,000 mg/L.

**Impairments.** Shallow, saline groundwater occurs within about 10 feet of the ground surface over a large portion of the subbasin. There are also localized areas of high iron, fluoride, nitrate, and boron in the subbasin (Hotchkiss 1971).

### **Water Quality in Public Supply Wells**

| <b>Constituent Group<sup>1</sup></b> | <b>Number of wells sampled<sup>2</sup></b> | <b>Number of wells with a concentration above an MCL<sup>3</sup></b> |
|--------------------------------------|--|--|
| Inorganics – Primary                 | 47   | 2  |
| Radiological                         | 47   | 1  |
| Nitrates                             | 51   | 4  |
| Pesticides                           | 47   | 1  |
| VOCs and SVOCs                       | 45   | 0  |
| Inorganics – Secondary               | 47   | 18   |

<sup>1</sup> A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

<sup>2</sup> Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

<sup>3</sup> Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

## Well Characteristics

| Well yields (gal/min) |                   |                    |
|-----------------------|-------------------|--------------------|
| Municipal/Irrigation  | Range: 20 – 5,000 | Average: 800-2,000 |
| Total depths (ft)     |                   |                    |
| Domestic              |                   |                    |
| Municipal/Irrigation  | Range: 50 - 800   | Average: 400-600   |

## Active Monitoring Data

| Agency  | Parameter   | Number of wells /measurement frequency |
|---|---|--|
| DWR (incl. Cooperators)   | Groundwater levels  | 816 Semi-annually                      |
| DWR (incl. Cooperators)<br>Department of Health Services<br>(incl. Cooperators) | Mineral, nutrient, & minor element.<br>Title 22 water quality | 120 Varies                             |

## Basin Management

Groundwater management: Panoche Water District is approximately 11 months into the AB3030 process and will be doing a joint plan with other districts and the county. [San Luis and Delta-Mendota Water Authority North](#) adopted an AB 3030 plan on December 5, 1997.

### Water agencies

#### Public

Merced County, Fresno County, Broadview WD, Centinella WD, Central California ID, Davis WD, Del Puerto WD, Eagle Field WD, El Solyo WD, Farmers WD, Firebaugh Canal WD, Foothill WD, Fresno Slough WD, Grasslands WD, Hospital WD, Kern Canon WD, Laguna WD, Mercy Springs WD, Mustang WD, Oak Flat WD, Orestimba WD, Oro Loma WD, Pacheco WD, Panoche WD, Patterson WD, Romero WD, Salado WD, San Luis Canal Company, San Luis WD, Santa Nella C.WD, Sunflower WD, Tranquility ID, West Stanislaus ID, Widren WD, Quinto WD

#### Private

None.

## References Cited

- California Department of Water Resources (DWR). San Joaquin District. 995. Internal computer spreadsheet for 1990 normal computation of net water demand used in preparation of DWR Bulletin 160-93.
- \_\_\_\_\_. 1981. Depth to Top of Corcoran Clay. 1:253,440 scale map.
- \_\_\_\_\_. 2000. *Spring 1999, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer*. 1:253,440 scale map sheet.
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## Additional References

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- \_\_\_\_\_. 1980. Bulletin 118-80. *Ground Water Basins in California*.

## Errata

Updated groundwater management information and added hotlinks to applicable websites.  
(1/20/06)

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# APPENDIX 4A GROUNDWATER OPERATIONAL YIELD MEMORANDUM

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## PREFACE

The attached memorandum entitled “Discussion on Operational Yield for the 2005 Urban Water Management Plan” was prepared by the City of Modesto and included in the Joint City of Modesto/MID 2005 and 2010 Urban Water Management Plans (UWMPs). The purpose of the memorandum was to describe the basis for estimating the “operational yield”, or annual groundwater pumping quantity, that could be extracted from the aquifer underlying the City’s water service area that includes the Modesto, Turlock and Delta-Mendota sub-basins. As described in the memorandum, the City’s Operational Yield was estimated to be 53,500 acre-feet per year.

The memorandum describes that the City had increased its groundwater pumping from 1999 to 2002 to meet growing demands, but that the City’s reliance on groundwater was anticipated to decrease when the Modesto Regional Water Treatment Plant (MRWTP) Phase Two is completed. Although the completion of MRWTP Phase Two has been delayed (currently anticipated to be completed in mid 2015), the findings and conclusions described in the memorandum have not changed.

It should be noted that the United States Geological Survey (USGS) is currently in the process of developing a simulation/optimization model of the Modesto Area Groundwater Basin for use in evaluating water resources management alternatives. It is not known when the USGS study will be completed. The findings of the USGS study may result in changes to the City’s estimate of the Operational Yield. However, the City’s current estimate of the Operational Yield of 53,500 af/yr will continue to be assumed pending the USGS study findings.

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# Memo

To: Nick Pinhey – Public Works Director  
Rolly Stevens – Assistant City Attorney  
Alison Barratt-Green – Senior Deputy City Attorney

From: William Wong – Associate Civil Engineer

CC: Rich Ulm, Jack Bond, Garner Reynolds, Jim Alves, Violet Jakab, Allen Lagarbo

Date:

Re: **FINAL** - Discussion on Operational Yield for the 2005 Urban Water Management Plan (UWMP)

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This memorandum establishes an empirical basis for estimating the “operational yield” for the rate of groundwater pumping within the City’s water service area that includes the Modesto, Turlock, and Delta-Mendota sub-basins. Information incorporated into this study includes water well pumping records, groundwater elevation data, and future demands based on land use densities at build-out.

For clarification, and as used in this report, the following terms are defined:

**Operational Yield** – is an amount (or rate in acre-feet per year) of localized groundwater withdrawn on an annual average basis by a given agency that does not exceed the long-term annual average recharge rate of the localized aquifer(s) from which the groundwater is being pumped.

**Sustainable Yield** – is similar to operational yield, but applies to an entire groundwater basin and all of the entities pumping from it as a whole, rather than just a localized area and a specific agency.

**Safe Yield** – is everything defined for sustainable yield, but also includes other considerations beyond just a quantity of water extracted or recharged, such as its quality and potential surface subsidence issues. Safe yield can be defined as the maximum amount of water that can be pumped without creating any long-term undesirable results. However, for the purposes of this report, safe yield is considered to be synonymous with sustainable yield.

**Overdraft** – is when the long-term annual average rate of extracted groundwater exceeds the annual average rate of recharge, as measured by groundwater levels (as measure of groundwater volume is difficult). Overdraft is also defined as the deficit between the water pumped from a groundwater basin and the long-term basin recharge.

The basis of previous estimates of the combined City’s “safe yield” of 50,000 AFY repeated in various City documents is not clear through researching of available literature. Previous documents reference a historic water budget, using data that was not directly measured, but estimated. The uncertainty of this data and the

determination of the safe yield are currently considered questionable, and recent data suggests that this value may not be correct.

This memorandum attempts to use existing data from various sources to reconcile an estimate of the City's current groundwater operational yield, instead of "safe yield" for the entire City of Modesto's Water Service Area.

**Establishing an Operational Yield:**

It is envisioned that the City will undertake a more comprehensive, hydro-geological groundwater yield study in the upcoming fiscal year where more resources can be devoted to the task of quantifying the City's groundwater operational yield. Until then, it is believed that the rate of extraction established in this report accurately reflects the best data readily available to staff and will be incorporated into the 2005 Urban Water Management Plan.

Prior to 1995, the City's sole source of domestic water was from groundwater pumping. The effect of long-term groundwater extraction consequently resulted in a decline of groundwater elevation, which led to temporary overdraft conditions, primarily in the downtown Modesto area. However, once the City began to implement conjunctive use by supplementing its water supplies with 33,602 AFY of treated surface water from Phase 1 of the MID Modesto Regional Water Treatment Plant (MRWTP) in 1995, the City has been able to reduce its groundwater extraction. As a result, groundwater levels began to rise correcting the temporary overdraft conditions. **Figure 1** shows that recent groundwater levels have decreased slightly as groundwater pumping increased over the last six years (2000 – 2005); however, until additional hydrogeologic studies are completed, it appears that current groundwater extractions and water levels are, to some extent, in a steady state condition.

The current annual water demands for the entire City of Modesto water system, in the Modesto and Turlock sub-basins, are over 79,000 AFY. The City's current rate of groundwater extractions is about 70% of the historically high pumping levels of 1994, and is not causing an overdraft condition.

**Table 1 – Current Annual Groundwater Extractions**

| Year                                   | Annual GW Extractions from the Modesto Subbasin (AFY) <sup>a</sup> | Annual GW Extractions from the Turlock Subbasin (AFY) <sup>a,b</sup> | Average GW Extractions from the Delta-Mendota Subbasin (AFY) <sup>a,c</sup> | Totals        |
|--|--|--|---|---------------|
| 2000                                   | 37,495   | 4,958  | 261   | 42,714        |
| 2001                                   | 40,857   | 4,837  | 297   | 45,991        |
| 2002                                   | 43,535   | 5,445  | 324   | 49,304        |
| 2003                                   | 41,990   | 5,053  | 287   | 47,330        |
| 2004                                   | 41,681   | 4,194  | 261   | 46,136        |
| 2005                                   | 41,090   | 4,849  | 237   | 46,176        |
| Average Annual Groundwater Extractions | <b>41,108</b>  | <b>4,889</b>   | <b>278</b>  | <b>46,275</b> |

- a. Based on City of Modesto SCADA records
- b. Includes South Modesto, Hickman, portions of North Ceres and Turlock.
- c. The Community of Grayson is within the Delta-Mendota Subbasin

As shown in **Table 1**, current six-year average (between 2000 and 2005) of groundwater extractions for the entire City of Modesto water system is 46,275 AFY. These water demands also reflect some water conservation due to continuous implementation of Stage I restrictions from the City's Drought Contingency Plan in 2003.



The City maximizes its surface water allocation within the City's contiguous service area, and must rely on groundwater pumping to meet its maximum day and peak hour demands. To meet the demands of future development, the City is currently working with the MID to double the capacity of the Modesto Regional Water Treatment Plant (MRWTP) to 67,204 AFY. However, the Phase 2 Expansion of the MRWTP is not anticipated to be on-line until mid- to late-2009, and therefore the City will need to increase its groundwater pumping to meet the demands for near-term development. This would be done by drilling new wells, rehabilitating currently out-of-service wells, or increasing the pumping from existing wells.

The movement of groundwater for both sub-basins is generally in a westward direction from the Sierra Nevada foothills. Recent analysis by the USGS and information from California's Groundwater Bulletin 118 has indicated that the geological characteristics of the Modesto and portions of Turlock sub-basins that are served by the City of Modesto appear to be similar. Although the Tuolumne River separates the Modesto and Turlock sub-basins, the USGS has determined that both groundwater and surface water systems are interconnected, and it can be reasonably assumed that groundwater flows between the two sub-basins. This has also been indirectly substantiated by analysis of the City's static well level data; the average groundwater elevations of the City's production wells between the Modesto and Turlock groundwater sub-basins are very comparable. Therefore, in this analysis, it is assumed that the cumulative groundwater extractions by the City apply to the entire City's water service area and no further distinctions are made between the two sub-basins (this does not apply to the Delta-Mendota sub-basin).

Based on California's Groundwater Bulletin 118 for the Modesto Sub-basin, as a result of long-term groundwater pumping, a cone of depression formed when the groundwater elevations reached around 30 feet above sea level (ASL) (see **Figure 2**). In order to extrapolate an operational yield using empirical data, a minimum groundwater elevation of 40 feet ASL was selected as the lowest elevation that the City will allow groundwater to reach. By establishing this minimum groundwater elevation allowable, the City can reasonably establish a conservative operational yield and be certain that the associated amount groundwater pumping should not result in an overdraft condition.

Based on a relative stabilization of groundwater elevations through the City's water service area, the City's current annual average groundwater pumping constitutes a non-overdraft condition, and therefore it can be assumed that the City is within its operational yield range. **Figure 3** plots the City's groundwater pumping and associated well levels between 1993 through 2006. It is apparent that there is not a linear relation between groundwater extractions to groundwater levels. Nevertheless, a linear factor rate was extrapolated from existing well information and can be considered a conservative representation of the effects of groundwater levels due to pumping. An empirical equation was extrapolated from these data points, which estimates that the groundwater levels will decline at a rate of approximately **0.685 feet/1,000 AFY** (or 1 foot per 1,430 AFY) of groundwater extracted over the entire water service area.

It is reasonable that, until hydrogeologic studies are complete, the City can use this estimated rate as the City's "**operational yield factor**". Using 40 ft ASL as the minimum allowable groundwater elevation, the associated **operational groundwater yield** is approximately **53,500 AFY**. This calculated operational yield is a projection of the City's water service area's groundwater pumping capacity (AFY) and is based on the following:

- Groundwater elevation data from 1993 to 2006 obtained from spring and fall field measurements by the City Water Department.
- Groundwater pumping data obtained from Water Department and from the City's SCADA from 2003 to current. Prior pumping records were obtained through Del Este and City of Modesto files.
- Assumes that Ag-to-Urban conversion accounted for in the calculated operational yield estimate.

The calculated operational yield does not account for:

- The City's ability to extract groundwater from the subbasins to meet demands.
- Seasonal peak water demands, and localized water distribution and pressure issues.

- Growth beyond the City's current water service area, either within the contiguous Modesto System or the outlying areas.
- Varying economic factors that could effect the projected growth assumptions.
- More stringent water quality standards would result in potential losses in well production from taking wells out-of-service due to contamination, such as from Arsenic, Nitrates and Uranium.

Additionally, once the City begins necessary groundwater studies to determine an actual operational yield (or specific yield) of the groundwater sub-basins, water budget and quality analyses for the groundwater sub-basins, the City would be able to develop procedures to optimize its groundwater extractions, and determine potential Aquifer Storage and Recovery (ASR) opportunities, where the City could potentially recharge the groundwater basins with surface water during seasonal low demand periods.

### **Conclusions:**

Recent projections from MID anticipate that Phase 2 of the MRWTP expansion will be complete by mid- to late-2009. However, until the additional 33,602 AFY of surface water is available to meet demands, the City will need to increase its groundwater extractions to meet water demands until Phase 2 is on-line.

More extensive studies and modeling will be required to quantify the City's operational yield and water budget for both the Modesto and Turlock sub-basins. However, based on self-imposed groundwater level limits, the City's current Operational Yield is estimated at **53,500 AFY**.

Recent information has indicated that the City has gradually increased its groundwater pumping over the last few years to meet growth demands. It is not anticipated that the City will continue to increase its groundwater extractions for an extended period of time, since Phase 2 is expected to be online by mid- to late- 2009. It is not expected that this short term increase of pumping would cause an overdraft condition in the Modesto Subbasin, which is typically a result from a cumulative effect of long-term over-pumping.

Figure 1 - 1993-2006 Groundwater Elevation and Pumping Data

**ESTIMATED ANNUAL  
GROUND WATER ELEVATION vs GROUND WATER  
PUMPING  
1993 - 2006**

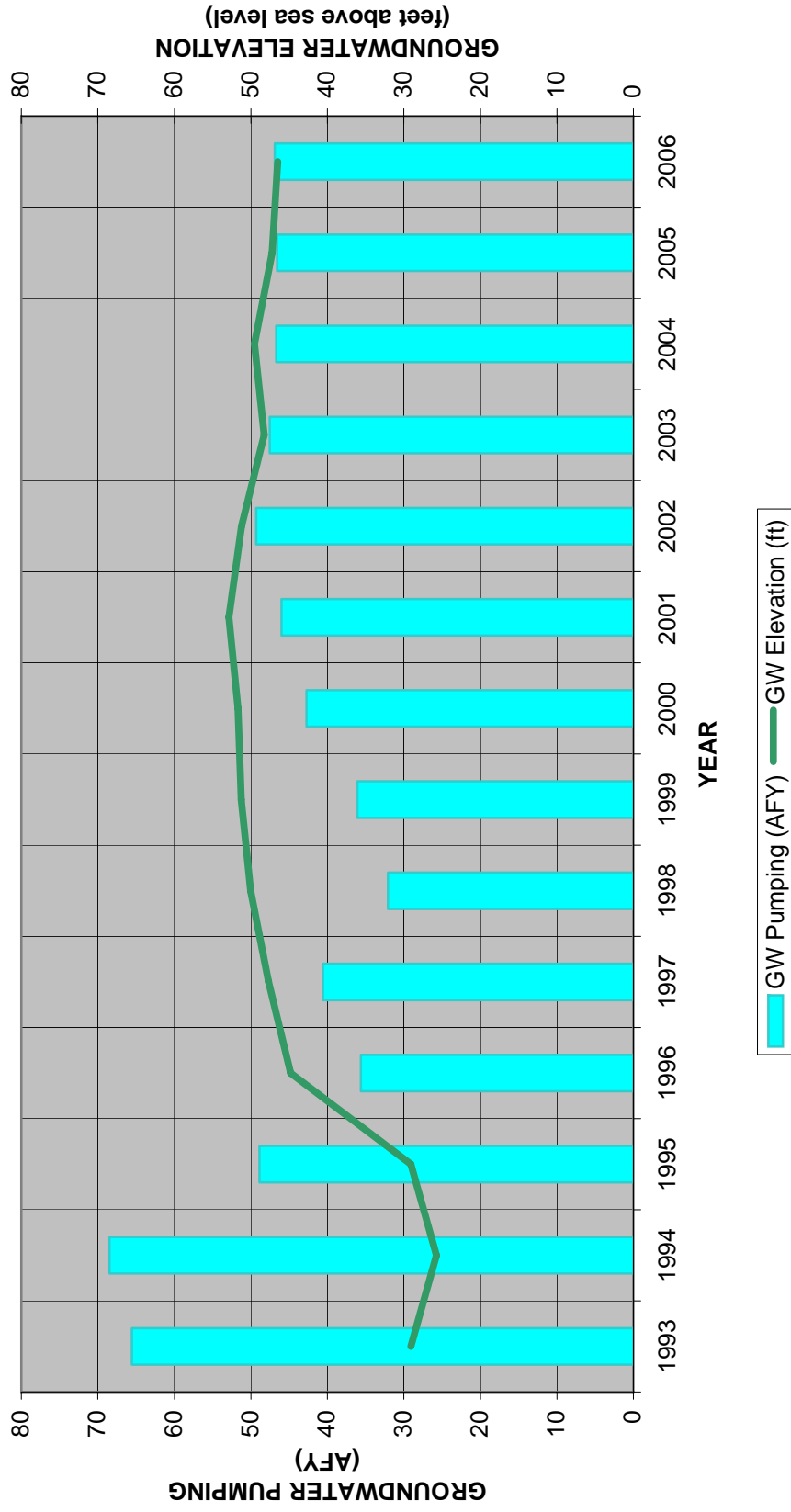
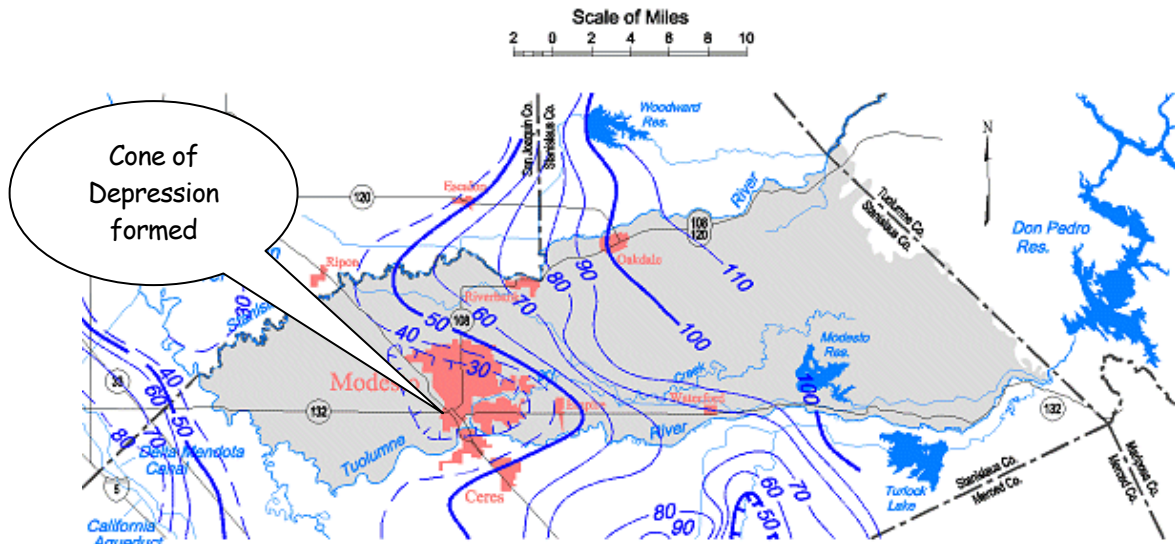


Figure 2 – 1993 and 1998 Groundwater Elevations (above sea level)

Source: Department of Water Resources (DWR) Website - [http://www.sjd.water.ca.gov/groundwater/basin\\_maps/index.cfm](http://www.sjd.water.ca.gov/groundwater/basin_maps/index.cfm)

# Modesto Groundwater Basin

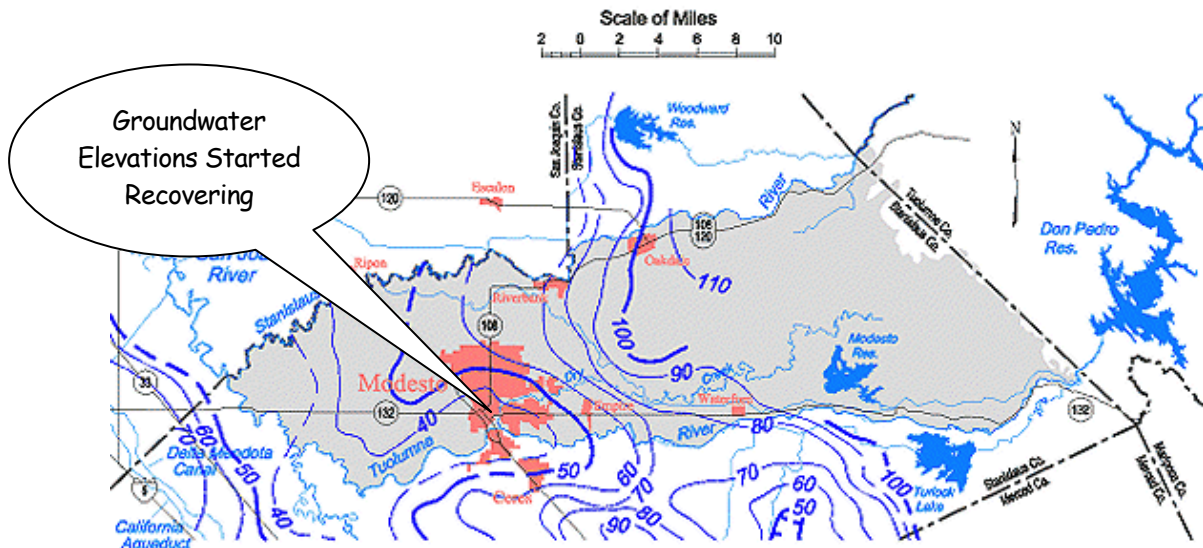
## Spring 1993, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 feet.

# Modesto Groundwater Basin

## Spring 1998, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 feet.

Figure 3 - Annual Groundwater Pumping (AFY) vs. Groundwater Elevation (feet, above sea level)

Groundwater Pumping vs Elevation (1993-2006)

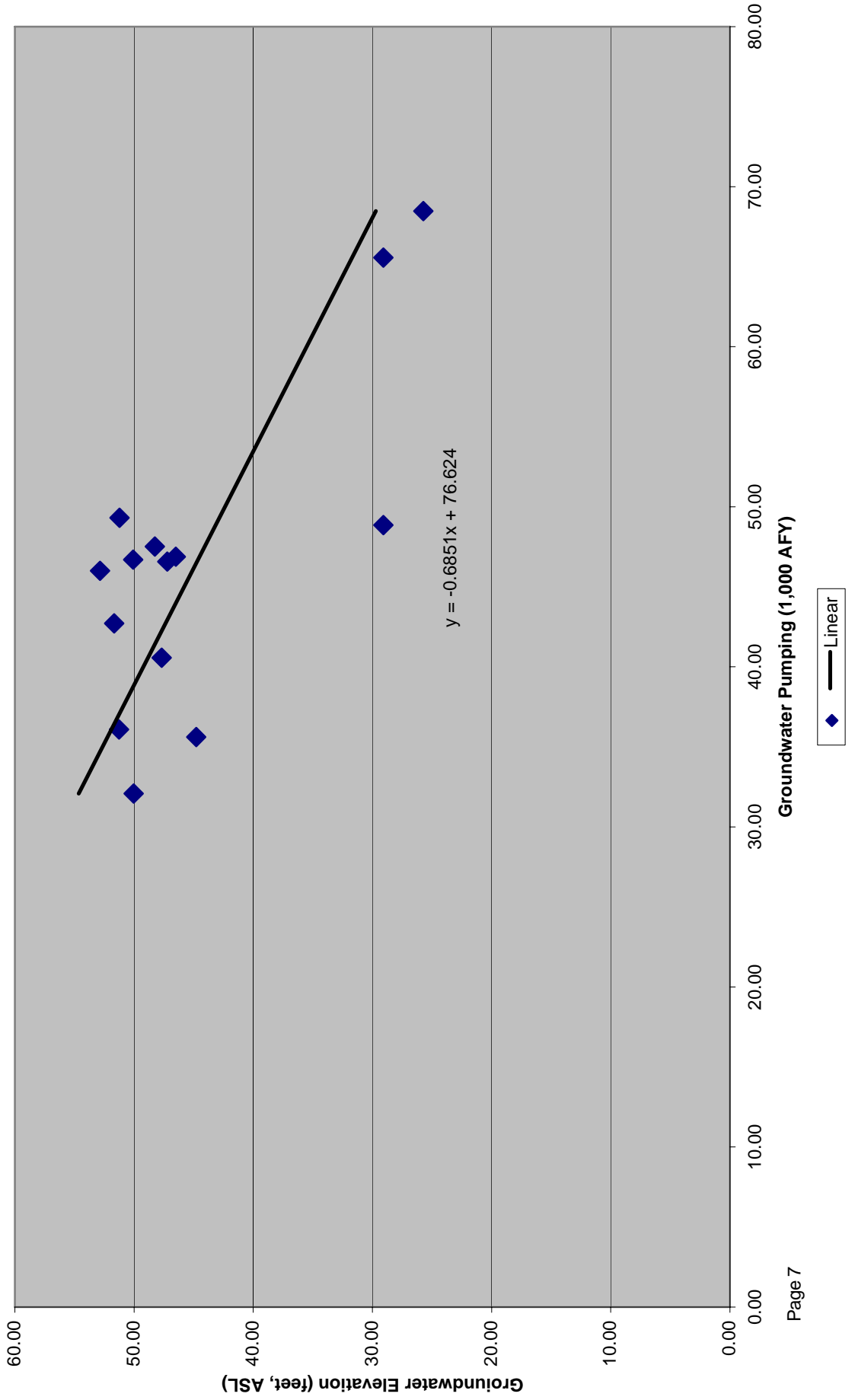
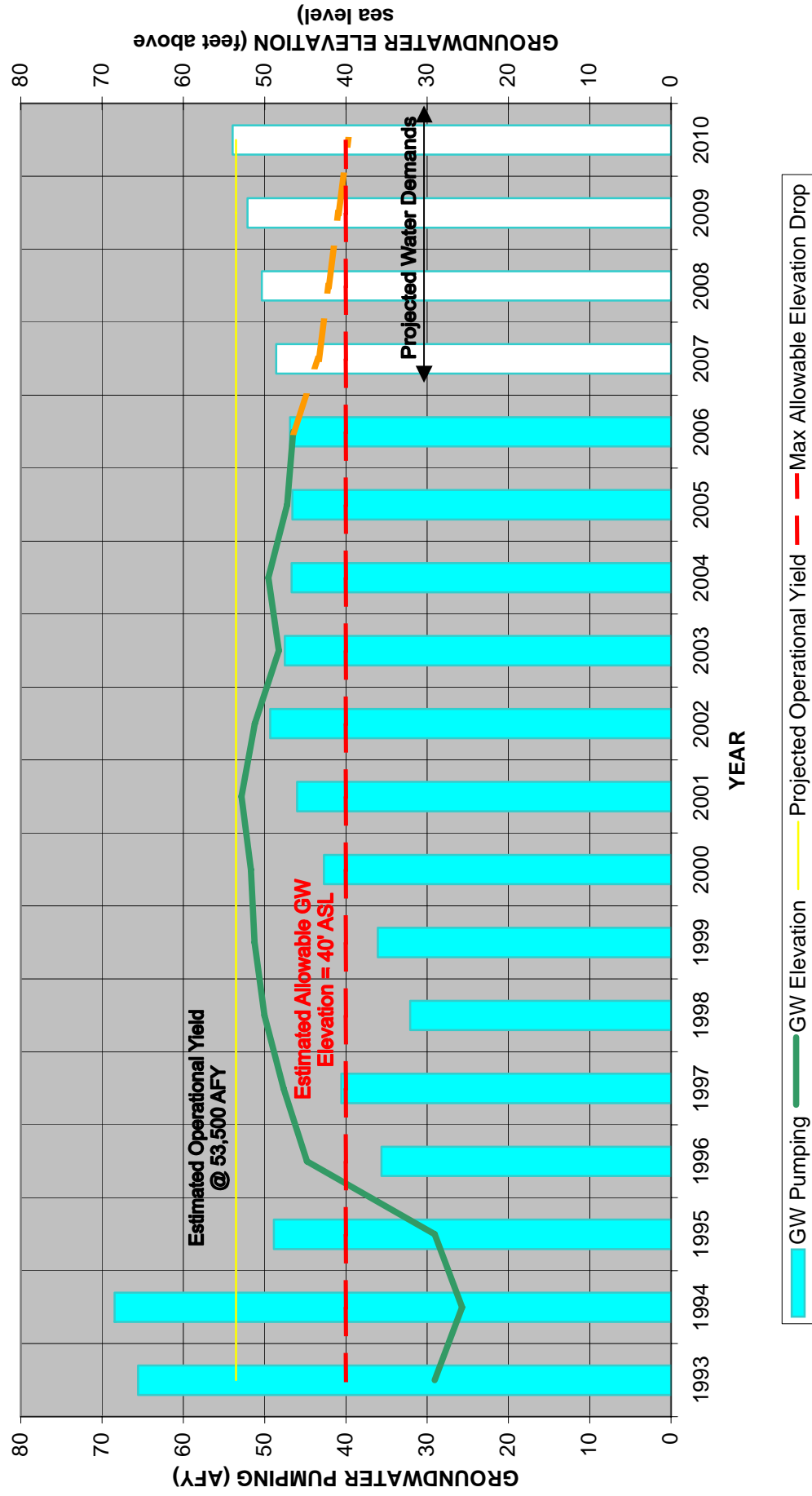


Figure 4 - Projected Near-Term Water Demands (to 2010)

## ACTUAL ANNUAL AND PROJECTED GROUND WATER ELEVATION vs GROUND WATER PUMPING

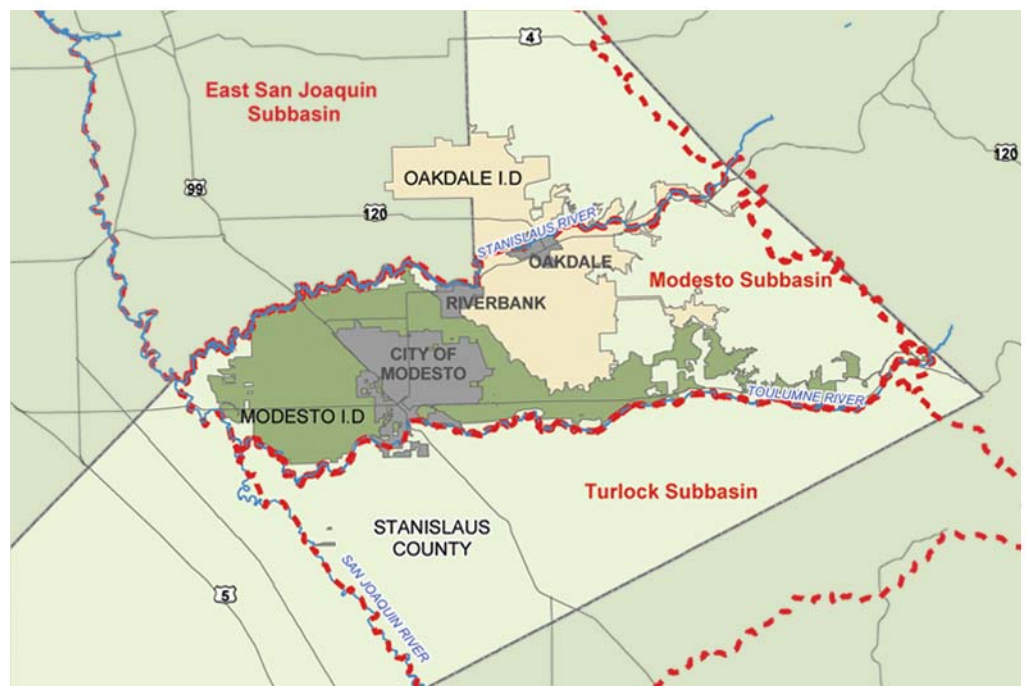


FINAL  
DRAFT

# Integrated Regional Groundwater Management Plan

for the Modesto Subbasin

*Stanislaus and Tuolumne Rivers Groundwater Basin Association*



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# TURLOCK GROUNDWATER BASIN

## Groundwater Management Plan

*Prepared for:*

Turlock Irrigation District  
333 East Canal Drive/P.O. Box 949  
Turlock, CA 95381

**March 18, 2008**

*Prepared by:*

Turlock Groundwater Basin Association

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# Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area

Groundwater Management Plan Update



San Luis & Delta-Mendota Water Authority

July 2011

Revised November 7, 2011

[http://www.sldmwa.org/OHTDocs/pdf\\_documents/Groundwater/  
GroundwaterManagementPlanNorthernApproved11\\_2011.pdf](http://www.sldmwa.org/OHTDocs/pdf_documents/Groundwater/GroundwaterManagementPlanNorthernApproved11_2011.pdf)



1120 West "I" Street, Suite C

Los Banos, CA 93635

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## APPENDIX I

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### Water Shortage Contingency

- City of Modesto Drought Contingency Plan
- Draft MID Resolution
- City of Modesto Resolution No. 2015-455
- City of Modesto Resolution No. 2016-178

DRAFT

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## CITY OF MODESTO – DROUGHT CONTINGENCY PLAN (Revised December 1, 2015)

*\*(Applies to all COM water users including residential, commercial, industrial, institutional, and private wells)*

| Drought Stage I – Minor Shortage Potential   | Drought Stage II – Moderate Shortage Potential   | Drought Stage III – Critical Shortage Potential   |
|--|--|---|
| <b>Phasing Criteria</b>  |  |   |
| * Extended periods of drought, associated with a warm, dry season, and due to lower than average precipitation and runoff.   | * Extended periods of drought, associated with a warm, dry season, and due to lower than average precipitation and runoff.   | * Extended periods of drought, associated with a warm, dry season, and due to lower than average precipitation and runoff.<br><br>* Production from wells is decreasing.<br><br>* There is a possibility that customer demands and system pressure requirements cannot be met at all times.   |
| <b>Reduction Objectives</b>  |  |   |
| 10%-20% reduction in total water production from baseline.   | 20%-35% reduction in total water production from baseline.   | 30%-40% reduction in total water production from baseline.  |
| <b>Requested Consumer Actions</b>  |  |   |
| <p>* Outdoor water use prohibited daily from noon - 7 p.m.*<br/>                     Odd-numbered addresses water W, F, Su<br/>                     Even-numbered addresses water, T, Th, Sa<br/>                     No outdoor water use on Mondays.<br/>                     * Car washing subject to above-cited limitations with use of a positive shutoff nozzle<br/>                     * Hosing concrete areas, building exteriors, etc., is prohibited except for health/safety concerns and only with use of a positive shutoff nozzle.<br/>                     * Water leaks, once identified by home owner, must be repaired within 24 hours.<br/>                     * Restaurants encouraged serving water only on request.</p> | <p>* Outdoor water use prohibited daily from 9 a.m. - 7 p.m.*<br/>                     Odd-numbered addresses water W, Su<br/>                     Even-numbered addresses water, T, Sa<br/>                     No outdoor water use on Mondays, Thursdays, &amp; Fridays.<br/>                     * Car washing subject to above-cited limitations with use of a positive shutoff nozzle<br/>                     * Hosing concrete areas, building exteriors, etc., is prohibited except for health/safety concerns and only with use of a positive shutoff nozzle.<br/>                     * Water leaks, once identified by home owner, must be repaired within 24 hours.</p> | <p>Odd-numbered addresses water Sunday<br/>                     Even-numbered addresses water Saturday<br/>                     * Outdoor water use prohibited Saturday and Sunday from 9 a.m. - 7 p.m.*<br/>                     No outdoor water use on Mondays, Tuesdays, Wednesdays, Thursdays, &amp; Fridays.<br/>                     * Car washing subject to above-cited limitations with use of a positive shutoff nozzle<br/>                     * Hosing concrete areas, building exteriors, etc., is prohibited except for health/safety concerns and only with use of a positive shutoff nozzle.<br/>                     * Water leaks, once identified by home owner, must be repaired within 24 hours.</p> |

|  |  |  |  |
|--|--|--|--|
| <p>* New landscaping to comply with existing &amp; future landscape ordinances.</p> <p>* Water meter installation on all new single-family homes.</p> <p>* Hours of restricted outdoor use may be extended to 9 a.m. – 7 p.m. at Council discretion.</p> | <p>* Restaurants and food service establishments prohibited from serving water except upon request.</p> <p>* New landscaping to comply with existing &amp; future landscape ordinances.</p> <p>* Mandatory retrofit of low flow showerheads in homes when building remodeling occurs.</p> <p>* No use of outdoor fountains except for maintenance purposes.</p> <p>*Water meter installation on all new single-family homes.</p> <p>*No irrigating turf or ornamental landscapes during and 48 hours following measurable rain.</p> <p>* Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option.</p> | <p>* Restaurants and food service establishments prohibited from serving water except upon request.</p> <p>* New landscaping to comply with existing &amp; future landscape ordinances.</p> <p>* Mandatory retrofit of low flow showerheads in homes when building remodeling occurs.</p> <p>* No use of outdoor fountains except for maintenance purposes.</p> <p>*Water meter installation on all new single-family homes.</p> <p>*No irrigating turf or ornamental landscapes during and 48 hours following measurable rain.</p> <p>* Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option.</p> | <p>*Moratorium on all new landscaping.</p> <p>*Building moratorium on all new connections, including new swimming pools.</p> |
|--|--|--|--|

|   |  |  |  |
|---|--|--|--|
| <p><b>Penalties * for Excessive Use</b></p>   |  |  |  |
| <p>\$ 50 Administrative Fee assessed upon 2nd violation.</p> <p>\$200 Admin. Fee assessed upon 3rd violation (includes meter installation</p> <p>\$500 Administrative fee assessed for each subsequent violation.</p> | <p>\$ 150 Administrative Fee assessed upon 2nd violation.</p> <p>\$250 Admin. Fee assessed upon 3rd violation (includes meter installation</p> <p>\$500 Administrative fee assessed for each subsequent violation.</p> | <p>\$ 150 Administrative Fee assessed upon 2nd violation.</p> <p>\$250 Admin. Fee assessed upon 3rd violation (includes meter installation</p> <p>\$500 Administrative fee assessed for each subsequent violation.</p> | <p>\$ 200 Administrative Fee assessed upon 2nd violation.</p> <p>\$300 Admin. Fee assessed upon 3rd violation (includes meter installation</p> <p>\$500 Administrative fee assessed for each subsequent violation.</p> |

\* Applies to residents inside the City limits or with a City of Modesto water service agreement.  
 \* Penalties assessed for violations occurring within 12 months of first violation.



**MODESTO IRRIGATION DISTRICT**

**RESOLUTION NO. 20\_\_-xxx**

**APPROVING ACTION RELATED TO THE IMPLEMENTATION OF AN  
ALTERNATIVE CURTAILMENT FORMULA OR WATER ALLOCATION BASIS IN  
ACCORDANCE WITH THE PROVISIONS INCLUDED IN THE AMENDED AND  
RESTATED TREATMENT AND DELIVERY AGREEMENT BETWEEN MODESTO  
IRRIGATION DISTRICT AND CITY OF MODESTO**

WHEREAS, on October 11, 2005, the Modesto Irrigation District Board of Directors and the City of Modesto City Council approved the Amended and Restated Treatment and Delivery Agreement Between Modesto Irrigation District and City of Modesto, and

WHEREAS, Section 17 of the Amended and Restated Treatment and Delivery Agreement describes provisions for the delivery of water by the Modesto Irrigation District to the City of Modesto, and

WHEREAS, Section 17.2 of the Amended and Restated Treatment and Delivery Agreement provides a formula for water allocation to the City of Modesto based on the actual number of inches of water allocated by the Modesto Irrigation District Board of Directors to agricultural water users for the subject irrigation season commencing immediately prior to each Domestic Water Year, and

WHEREAS, Section 17.4 of the Amended and Restated Treatment and Delivery Agreement describes provisions for the adjustment of curtailment of water deliveries, and

WHEREAS, only\_\_ inches of water were allocated by the Modesto Irrigation District Board of Directors for the 20\_\_ irrigation season, and thus the 20\_\_ allocation for the City of Modesto is only \_\_\_\_\_ acre-feet of treated water, significantly less than the maximum treated water allocation of 67,204.2 acre-feet per year, and

WHEREAS, the current severe and prolonged drought threatens the ability of the City of Modesto to deliver adequate drinking water to its customers despite its efforts to impose rationing and to utilize all water resources available to it, and

WHEREAS, the parties have met and conferred for the purpose of reaching an agreement as to an alternative curtailment formula or water allocation basis which more equitably and more fairly meets the needs of the agricultural and municipal water users within the Modesto Irrigation District's boundaries.

NOW, therefore, BE IT RESOLVED, That the Board of Directors of the Modesto Irrigation District does hereby adopt the Adjustment for Curtailment Provisions described in Section 17.4 of the Amended and Restated Treatment and Delivery Agreement to be implemented as follows:

*[Based on specific hydrologic, water supply, and water demand conditions present at the time of this proposed resolution, describe alternative curtailment formula or water allocation basis which more equitably and more fairly meets the needs of the agricultural and municipal water users within the District's boundaries]*

Moved by Director \_\_\_\_\_, seconded by Director \_\_\_\_\_, that the foregoing resolution be adopted.

The following vote was had:

Ayes: Directors \_\_\_\_\_

Noes: Directors \_\_\_\_\_

Absent: Directors \_\_\_\_\_

The President declared the resolution adopted.

oOo

I, Pat Mills, Secretary of the Board of Directors of the MODESTO IRRIGATION DISTRICT, do hereby CERTIFY that the foregoing is a full, true and correct copy of a resolution duly adopted at a [regular/special] meeting of said Board of Directors held the \_\_\_\_ day of \_\_\_\_ 20\_\_\_\_.

Secretary of the Board of Directors  
of the Modesto Irrigation District

**MODESTO CITY COUNCIL  
RESOLUTION NO. 2015-455**

**RESOLUTION APPROVING REVISIONS TO THE CITY OF MODESTO  
DROUGHT CONTINGENCY PLAN AND ENACTING DROUGHT STAGE IIA  
REQUIREMENTS THAT RESTRICT OUTDOOR WATERING TO ONE DAY A  
WEEK EFFECTIVE DECEMBER 1, 2015**

WHEREAS, On March 17 2015, the State Water Resources Control Board adopted additional emergency drought regulations to govern the use of urban water in California, which requires the City of Modesto to meet a 36 percent (36%) cumulative reduction for the period of June 2015 through February 2016, and

WHEREAS, Section 11-1.14 of the Modesto Municipal Code authorizes the City Council to establish rules and regulations by resolution concerning the City's municipal water system, the use of water, and water conservation, and

WHEREAS, on May 1, 2015, the City Council, by Resolution No. 2015-134, implemented the Stage II Plan requirements of the Drought Contingency Plan, which included an increase in the monetary penalty amounts for excessive water use and restricted outdoor watering to twice weekly, and

WHEREAS, California continues to endure severe drought conditions and most of the state, including our area, is experiencing exceptional drought conditions as defined by the United States Drought Monitor, and

WHEREAS, staff is tracking water production reduction percentages and as of October 31, 2015, the City is at a 29% reduction, and

WHEREAS, to assist us in sustaining our water supply and meet state-mandated reduction goals, staff has revised the Drought Contingency Plan to add a Stage IIA that implements one-day per week watering for all City of Modesto customers, and

WHEREAS, addresses ending in an even number will water only on Saturday and addresses ending in an odd number will water only on Sunday, and

WHEREAS, staff recommended that the City Council approve the revisions to the Plan and implement Stage IIA requirements effective December 1, 2015.

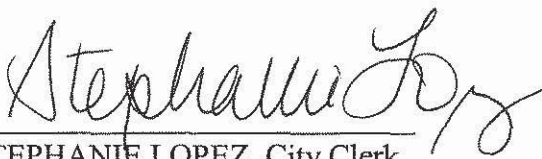
NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Modesto that it hereby approves revisions to the City of Modesto Drought Contingency Plan and enacts Drought Stage IIA requirements that restrict outdoor watering to one day a week effective December 1, 2015.

The foregoing resolution was introduced at a regular meeting of the Council of the City of Modesto held on the 24th day of November 2015, by Councilmember Madrigal, who moved its adoption, which motion being duly seconded by Councilmember Kenoyer, was upon roll call carried and the resolution adopted by the following vote:

AYES: Councilmembers: Ah You, Grewal, Kenoyer, Madrigal, Ridenour, Zoslocki, Mayor Marsh

NOES: Councilmembers: None

ABSENT: Councilmembers: None

ATTEST:   
STEPHANIE LOPEZ, City Clerk

(SEAL)

APPROVED AS TO FORM:

By:   
ADAM U. LINDGREN, City Attorney

**MODESTO CITY COUNCIL  
RESOLUTION NO. 2016-178**

**RESOLUTION APPROVING REINSTATEMENT OF THE DROUGHT STAGE II REQUIREMENTS OF THE CITY OF MODESTO DROUGHT CONTINGENCY PLAN TO ALLOW OUTDOOR WATERING TO TWO DAYS A WEEK EFFECTIVE MAY 1, 2016 THROUGH OCTOBER 31, 2016**

WHEREAS, on March 17 2015, the State Water Resources Control Board (SWRCB) adopted additional emergency drought regulations to govern the use of urban water in California, which required the City of Modesto to meet a thirty-six percent (36%) cumulative reduction for the period of June 2015 through February 2016, and

WHEREAS, Section 11-1.14 of the Modesto Municipal Code authorizes the City Council to establish rules and regulations by resolution concerning the City's municipal water system, the use of water, and water conservation, and

WHEREAS, on November 24, 2015 City Council, by Resolution No. 2015-455, revised the City of Modesto Drought Contingency Plan and enacted Drought Stage IIA requirements to restrict outdoor watering to one day a week effective December 1, 2015, and

WHEREAS, California continues to endure severe drought conditions and most of the state, including our local area, is experiencing exceptional drought conditions as defined by the United States Drought Monitor, and

WHEREAS, the Governor recently extended the emergency drought regulations through October 2016 by executive order, and

WHEREAS, the SWRCB eased the restriction for the City of Modesto to require a thirty-four percent (34%) cumulative reduction in water use through October 2016, and

WHEREAS, staff recommended that the City Council approve returning to Drought Stage II of the Drought Contingency Plan effective May 1, 2016 through October 31, 2016 and,

WHEREAS, Drought Stage II of the Drought Contingency Plan implements a two-day per week outdoor watering schedule for all City of Modesto customers with addresses ending in an even number watering only on Tuesdays and Saturdays and addresses ending in an odd number watering only on Wednesdays and Sundays, and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Modesto that it hereby approves reinstatement of the Drought Stage II requirements of the City of Modesto Drought Contingency Plan that restrict outdoor watering to two days a week effective May 1, 2016 through October 31, 2016.

The foregoing resolution was introduced at a regular meeting of the Council of the City of Modesto held on the 26<sup>th</sup> day of April, 2016, by Councilmember Ridenour, who moved its adoption, which motion being duly seconded by Councilmember Kenoyer, was upon roll call carried and the resolution adopted by the following vote:

AYES: Councilmembers: Ah You, Grewal, Kenoyer, Madrigal, Ridenour, Zoslocki, Mayor Brandvold

NOES: Councilmembers: None

ABSENT: Councilmembers: None

ATTEST:   
STEPHANIE LOPEZ, City Clerk

(SEAL)

APPROVED AS TO FORM:

By:   
ADAM U. LINDGREN, City Attorney

## APPENDIX J

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### Water Conservation Program Information

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**MODESTO CITY COUNCIL  
RESOLUTION NO. 2011-192**

**RESOLUTION ADOPTING THE MODESTO WATER CONSERVATION PLAN**

WHEREAS, effective January 2009, Assembly Bill 1420 (AB 1420) amended the State Water Code to require agencies to implement or have a plan to implement the specific Demand Management Measures (DMMs) accepted by the State Department of Water Resources (DWR) as qualifying conservation plans before being eligible for state water management grants and loans, and

WHEREAS, agencies can demonstrate to DWR their implementation of the DMMs or their implementation plan by completing and submitting AB 1420 Self-Certification Statement Tables, which summarize their Conservation Plan DMM implementation schedule and other required details, and

WHEREAS, although Modesto has had an active and managed Water Conservation Program for many years, a Conservation Plan document describing these DMMs that support the Self-Certification Statement Tables has not been formally developed, and

WHEREAS, on April 27, 2010, the City Council, by Resolution No. 2010-151, amended an existing agreement with RMC Water and Environment to use remaining contract funds to develop a Conservation Plan, and

WHEREAS, the Conservation Plan describes the process to meet all of the goals for the DMMs over the next ten years, and

WHEREAS, the overall intent of the Conservation Plan is to promote water conservation programs and maximize real water conservation results in the most effective an economical means available, and

WHEREAS, the DMMs also serve as a plan to achieve the mandated 2015 Interim and 2020 Final per-capita water use targets developed in the 2010 Urban Water Management Plan (2010 UWMP), which was adopted under a separate Council action, and

WHEREAS, on March 28, 2011, the City submitted for DWR's review the completed AB 1420 Self-Certification Statement Tables, and

WHEREAS, on April 14, 2011, the City received notification from DWR affirming the City's compliance with AB 1420 which states that Modesto is eligible to receive water management grants and loan funds,

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Modesto that it hereby adopts the Modesto Water Conservation Plan.

The foregoing resolution was introduced at a regular meeting of the Council of the City of Modesto held on the 24<sup>th</sup> day of May, 2011, by Councilmember Marsh, who moved its adoption, which motion being duly seconded by Councilmember Muratore, was upon roll call carried and the resolution adopted by the following vote:

AYES: Councilmembers: Burnside, Geer, Hawn, Lopez, Marsh, Muratore, Mayor Ridenour

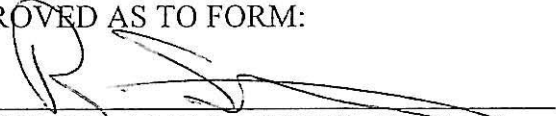
NOES: Councilmembers: None

ABSENT: Councilmembers: None

ATTEST:   
STEPHANIE LOPEZ, City Clerk

(SEAL)

APPROVED AS TO FORM:

By:   
SUSANA ALCALA WOOD, City Attorney

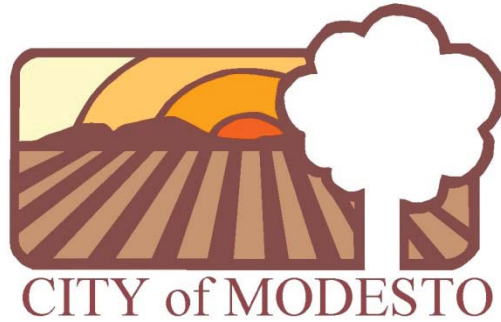
THIS IS TO CERTIFY THAT THIS  
IS A TRUE COPY OF THE DOCUMENT ON  
FILE WITH THIS OFFICE.

DATE May 31, 2011



SIGNATURE  
CITY CLERK  
CITY OF MODESTO, CA

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# City of Modesto Water Conservation Plan

Prepared by:  
**RMC**  
*Water and Environment*

May 2011

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**Appendices**

**Appendix A -**

**School Educational and Public Outreach Materials Examples**

**Appendix B -**

**City of Modesto Water Shortage Contingency Plan**



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## **List of Abbreviations**

|       |   |
|-------|---|
| AF    | Acre-feet                                       |
| AFY   | Acre-feet per year                              |
| BMP   | Best Management Practice                        |
| CEQA  | California Environmental Quality Act            |
| cfs   | cubic feet per second                           |
| CII   | Commercial, Industrial, and Institutional       |
| CUWCC | California Urban Water Conservation Council     |
| DMM   | Demand Management Measure                       |
| DPH   | Department of Public Health                     |
| DWR   | California Department of Water Resources        |
| EDU   | Equivalent Dwelling Unit                        |
| EIR   | Environmental Impact Report                     |
| ETo   | Reference Evapotranspiration                    |
| gpd   | gallons per day                                 |
| gpm   | gallons per minute                              |
| HEWM  | High Efficiency Washing Machine                 |
| ID    | Improvement District                            |
| IRWMP | Integrated Regional Water Management Plan       |
| mgd   | Million gallons per day                         |
| MID   | Modesto Irrigation District                     |
| MOU   | Memorandum of Understanding                     |
| NPDES | National Pollutant Discharge Elimination System |
| PG&E  | Pacific Gas and Electric                        |
| TID   | Turlock Irrigation District                     |
| ULFT  | Ultra-Low-Flush Toilet                          |
| UWMP  | Urban Water Management Plan                     |
| WSS   | WaterSense Specification                        |

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## Chapter 1 Introduction

The City of Modesto (City) has acknowledged the importance of water conservation and management, and has implemented significant water conservation efforts during the drought years of 1976-1977 and 1987-1992 in addition to maintaining ongoing conservation programs. In March 1990, the City of Modesto City Council approved a Water Conservation Program (Section 11-1.14 of Title XI of the Modesto Municipal Code) which combined a strong education program with watering restrictions and prohibition of water waste. The City of Modesto has now developed this Water Conservation Plan, building upon the demand management measures and conservation strategies identified and documented in the 2005 Urban Water Management Plan (UWMP) Update, with the intent to better define the City's Conservation Program and to plan for conservation program implementation in the future.

The City's Water Conservation Program is administered through the City's Water Operations Division of the Public Works Department. The City has implemented, or plans to implement, all of the Best Management Practices (BMPs) included in the 2005 UWMP program as defined in the December 2008 California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU), the corresponding document to the demand management measures denoted in the 2005 UWMP Guidelines and the State's AB1420 water use efficiency program. The City is currently preparing its 2010 UWMP which will include this conservation plan. This plan will then be adopted by the City of Modesto's City Council in conjunction with its 2010 UWMP.

### 1.1 History

The City of Modesto began providing potable water service in 1895 following the purchase and acquisition of several private water companies. Until 1995, the sole source of water supply to the City was groundwater from the Modesto and Turlock groundwater subbasins (part of the San Joaquin Valley Groundwater Basin). Groundwater levels started to decline in 1924, particularly in the downtown area, due to increased groundwater pumping for urban uses. In the early 1990s, the City of Modesto, Modesto Irrigation District (MID), and Del Este Water Company formed a partnership to use a portion of MID's surface water supplies for municipal use, resulting in the implementation of the Modesto Domestic Water Project (MDWP). Phase 1 of the MDWP consists of a 30 million gallon per day (mgd) surface water treatment plant and storage and delivery facilities, all of which were operational in 1995. Phase 2 of the program includes the expansion of the Modesto Regional Water Treatment Plant (MRWTP), built and operated by MID, to treat an additional 30 mgd. This plant upgrade is scheduled to come on-line by 2013.

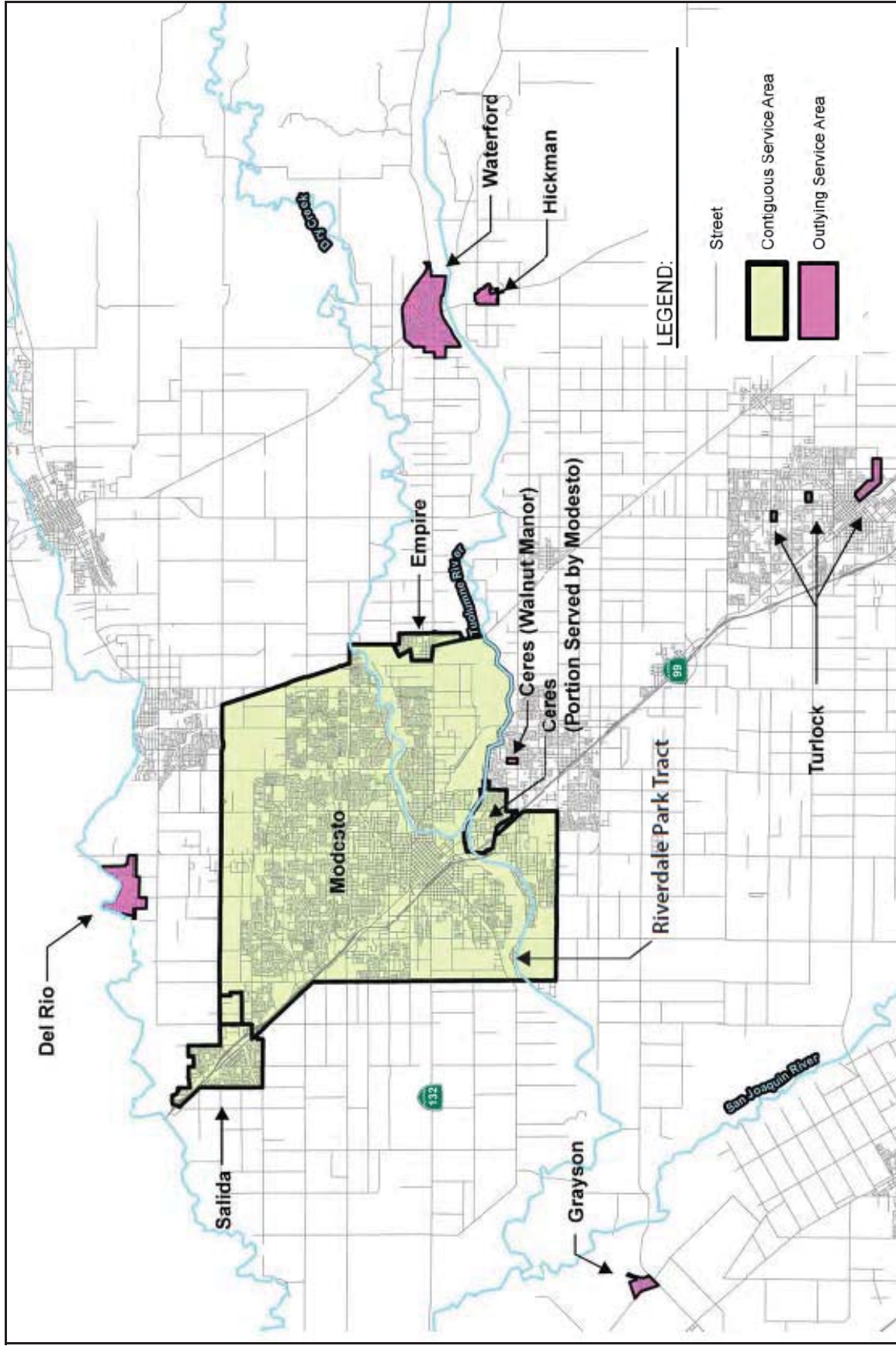
In July 1995, the City acquired the Del Este Water Company, which had previously served approximately 30% of the municipal customers in the Modesto area. As a result of this acquisition, the City of Modesto became the primary domestic water purveyor in Stanislaus County, serving not only the City of Modesto, but also the communities of Waterford, Hickman, Del Rio, Salida, Grayson, Empire and parts of Ceres and Turlock. The MRWTP delivers water to municipal customers within the city limits of the City of Modesto north of the Tuolumne River, as well as the communities of Salida and Empire. The City serves municipal customers south of the Tuolumne River in the Turlock Irrigation District (TID) service area from groundwater. TID currently serves only agricultural customers and does not supply water for municipal uses.

The City of Modesto is currently dependent on groundwater for up to 60 percent of its total supply during summer and fall months. Recently, the City entered into an agreement with TID to participate in design of a Regional Surface Water Supply Project (RSWSP), to be located east of Modesto on the south side of the Tuolumne River. Under a future Treatment and Delivery Agreement (TDA) with TID, up to 6,720 AFY (6 MGD) of TID surface water from the RSWSP Phase 1 would be delivered to the south Modesto area, enhancing the City's ability to manage its surface and groundwater supplies conjunctively. Upon completion of Phase Two of the MRWTP, the City will increase surface water use and reduce groundwater pumping to below current usage, allowing for in-lieu groundwater banking in which

groundwater supplies accumulate in the groundwater basin for use in meeting normal and dry year demands in the future. The City of Modesto's water service area is shown in Figure 1-1.

As the City manages its water service area, it recognizes that water is a regional resource as well as a local one. Therefore, regional partnerships, in addition to local projects and conservation measures, play a large role in maximizing resources. The City is currently participating in the preparation of an Integrated Regional Water Management Plan (IRWMP) with other local entities, including the Cities of Ceres, Hughson and Turlock, as well as Turlock Irrigation District and Modesto Irrigation District. Participation in the IRWM planning process allows the City and its partners to develop a regional plan to identify resources and develop projects to provide sustainable water resources to meet regional water needs.

Figure 1-1: City of Modesto Water Service Area



Source: 2010 Water System Engineer's Report Draft Program Environmental Impact Report (ICF Jones & Stokes, 2009)

## 1.2 Physical Setting

Water use within the Modesto area is dependent upon various climate factors such as temperature, precipitation, and evapotranspiration (ET). ET is a term used to describe water lost through evaporation from the soil and surface-water bodies combined with plant transpiration. In general, the reference evapotranspiration (ET<sub>o</sub>) is given for turf grass, and then corrected for a specific crop type. Local ET<sub>o</sub> data was obtained from California Irrigation Management Information System (CIMIS) station #71, located west of Modesto, California and operated by DWR. Table 1-1 shows the historic climate characteristics affecting water management in the Modesto area.

**Table 1-1: Modesto Climate**

| Month   | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Ann.  |
|---|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Monthly Average ET <sub>o</sub> <sup>(1)</sup> (in) | 0.87 | 1.71 | 3.43 | 5.24 | 6.7  | 7.4  | 7.85 | 6.75 | 4.93 | 3.37 | 1.66 | 0.87 | 50.78 |
| Average Total Precipitation <sup>(2)</sup> (in)     | 2.37 | 2.13 | 1.94 | 1.07 | 0.46 | 0.09 | 0.03 | 0.04 | 0.2  | 0.64 | 1.36 | 2.1  | 12.42 |
| Average Max Temperature <sup>(2)</sup> (°F)         | 53.7 | 60.8 | 66.9 | 73.4 | 81.1 | 88.2 | 94.1 | 92.1 | 87.7 | 78   | 64.4 | 54.2 | 74.5  |
| Average Min Temperature <sup>(2)</sup> (°F)         | 37.7 | 40.9 | 43.4 | 46.8 | 51.7 | 56.4 | 59.8 | 58.7 | 56   | 49.7 | 41.7 | 37.8 | 48.4  |

Notes:

1. Data from CIMIS Station #71. CIMIS information is available only from June 1987 to the present.
2. Data from Western Regional Climate Center (<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?camode+nca>) for Modesto, CA. Period of record is 1/1/1931 through 12/31/04.

Other climate characteristics that affect water management in the Modesto area include solar radiation, relative humidity, dew point, wind speed, and soil temperature.

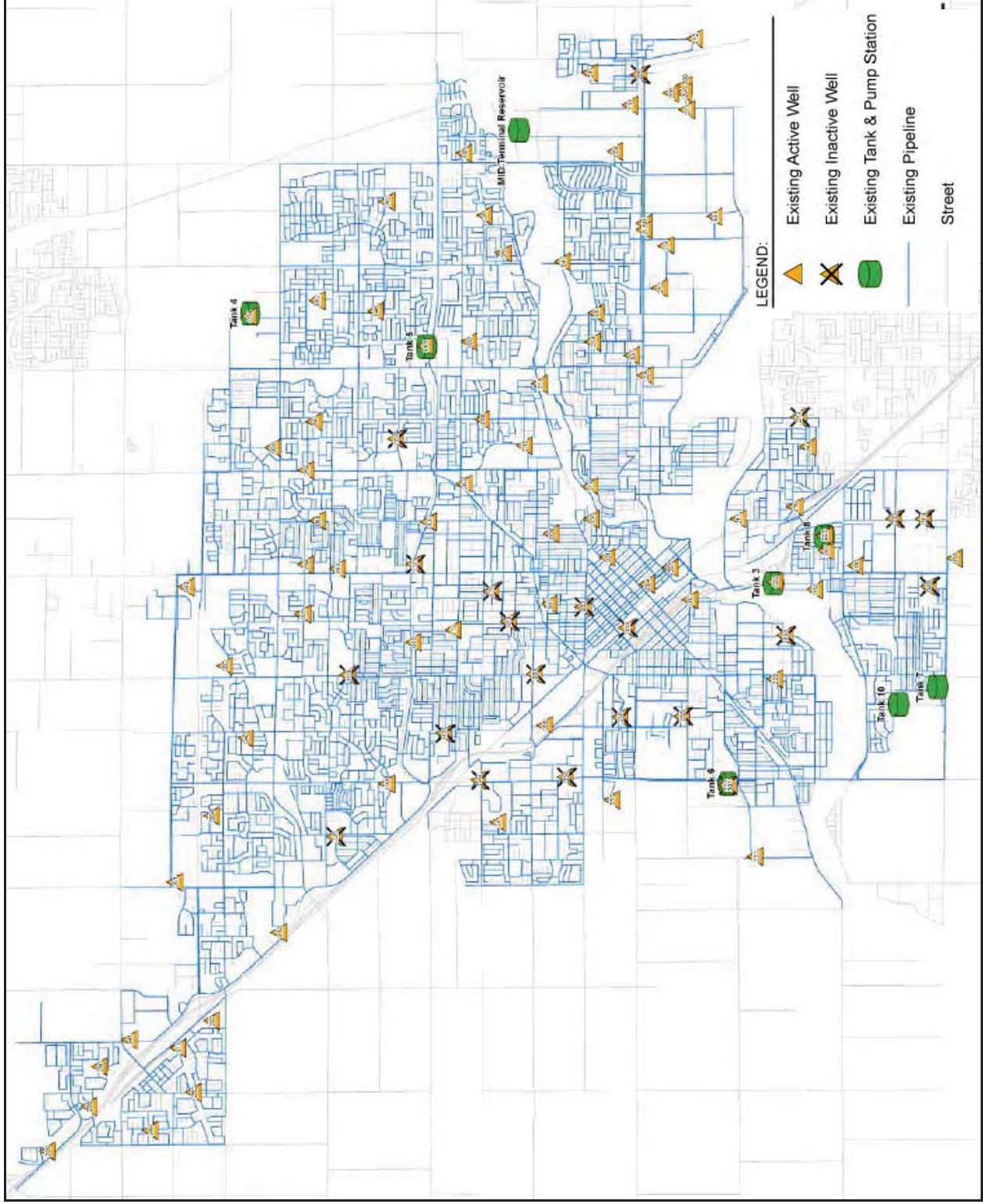
## 1.3 System Description

The City of Modesto obtains its water supply from groundwater from the Modesto and Turlock groundwater subbasins and from treated Tuolumne River water from MID. As previously noted, the City of Modesto's water service area includes former Del Este Water Company systems in Empire, Salida, Waterford, Hickman, Grayson, Del Rio, and portions of Ceres and Turlock in Stanislaus County. There are over 77,000 water connections, 940 miles of water lines in the water system, 113 groundwater wells (21 are currently not operated due to water quality reasons), and eleven water tanks (one is not yet operational and one is older and not currently used). There are two raw water reservoirs serving the Modesto area: the Modesto Reservoir and New Don Pedro Reservoir. Completed in 1911, owned and operated by MID, Modesto Reservoir has a gross storage capacity of 28,000 acre-feet (AF). The New Don Pedro Reservoir, owned and operated by MID and TID, is located four miles northeast of La Grange in the Sierra Nevada foothills and is 26 miles long with a capacity of 2.03 million AF.

## 1.4 Conservation Policy

The City updated their 2005 UWMP which discussed the fourteen water conservation measures that were being implemented by the City (referred to by the California Department of Water Resources (DWR) as Demand Management Measures or DMMs). Historically, the City has directly budgeted for conservation programs each fiscal year and implemented programs as deemed prudent. The fourteen existing DMMs, as set forth in the 2005 UWMP Update, are described and updated accordingly in Chapter 3, Conservation Programs.

Figure 1-2: Major Water Facilities



Source: 2010 Water System Engineer's Report Draft Program Environmental Impact Report (ICF Jones & Stokes, 2009)

## Chapter 2 Conservation Policies and Program Goals

The City's goals are to conserve water through public relations, education, customer service, and enforcement. The City strives to meet this challenge by working in a friendly, respectful and positive manner with homeowners, businesses and property managers (RMC, 2007).

In preparation of this Water Conservation Plan, the City of Modesto developed the following policy statement, reflecting its belief in water conservation:

*To protect, conserve, and manage all water resources for the current and future needs of the community and the environment.*

The overall goal is to develop a system-wide water conservation plan containing acceptable water efficiency measures and an implementation plan which will decrease water use and water loss while using the most cost-effective methods.

Furthermore, with the preparation and implementation of this plan, the City aims to:

1. Be compliant with Assembly Bill 1420 (AB 1420) requiring the implementation of fourteen baseline conservation measures of Best Management Practices (BMPs).
2. Meet California Urban Water Conservation Council goals as outlined in the Memorandum of Understanding Regarding Urban Water Conservation in California for the fourteen conservation measures identified in the 2005 UWMP.
3. Create an implementation program for conservation measures based on affordability and feasibility.



## Chapter 3 Conservation Programs

This section describes the existing water conservation measures or programs, referred to interchangeably as Best Management Practices (BMPs) or Demand Management Measures (DMMs), that the City is implementing and/or plans for future implementation.

As previously stated, the City of Modesto prepared a 2005 UWMP Update in 2007. The UWMP summarized fourteen primary conservation measures, referred to as DMMs, as required by the 2005 UWMP Guidebook. These fourteen conservation measures are the same fourteen measures referred to as BMPs in the California Urban Water Conservation Council (CUWCC) *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU), adopted the 1991 and amended in December 2008. These BMPs are considered base or foundational programs required to expedite implementation of reasonable water conservation measures in urban areas. Furthermore, these same fourteen measures have since become the primary measures by which the California Department of Water Resources (DWR) Office of Water Use Efficiency measures compliance with Assembly Bill (AB) 1420. AB 1420 amended the Urban Water Management Planning Act, Water Code Section 10610 *et seq.* to require effective January 1, 2009, that the terms of and eligibility for any water management grant or loan made to an urban water supplier and awarded or administered by the DWR, State Water Resources Control Board (SWRCB) or California Bay-Delta Authority (CBDA) or its successor agency, be conditioned on the implementation of the water DMMs described in Water Code Section 10631(f). AB 1420 certification requires that each DMM be implemented to the levels of coverage as specified in the CUWCC MOU.

This Conservation Plan was prepared considering the City's conservation needs, the requirements of the Urban Water Management Planning Act and the requirements of AB 1420 certification. To that end, of the fourteen DMMs documented in the UWMP guidelines and the AB1420 certification documents is discussed below. For each DMM, the measure is described and the requirements for CUWCC MOU compliance and compliance documentation required are presented. The CUWCC MOU requirements were used herein as measures for City compliance as the AB1420 legislation uses this document as its measure for State-wide compliance with the legislation.

### 3.1 DMM 1: Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers

#### 3.1.1 CUWCC Description

DMM 1 is intended to provide water survey programs for both single-family and multi-family residential customers. Survey programs are to encompass both indoor and outdoor water use. Specifically, DMM 1 is to include the following.

Residential Assistance - Provide site-specific leak detection assistance that may include, but is not limited to a water conservation survey, water efficiency suggestions, and/or inspection.

Landscape Water Survey - Perform site-specific landscape water surveys that shall include, but are not limited to, the following: check irrigation system and timers for maintenance and repairs needed; estimate or measure landscaped area; develop customer irrigation schedule based on precipitation rate, local climate, irrigation system performance, and landscape conditions; review the scheduling with customer; provide information packet to customer; and provide customer with evaluation results and water savings recommendations.

### 3.1.2 CUWCC Documentation Requirement

Provide reports, disaggregated by single-family and multi-family units, identifying the number of:

- residential assistance/leak detection survey visits completed
- WaterSense Specification (WSS) showerheads distributed
- WSS faucet aerators distributed during the reporting period

In addition, provide the number of single-family and multi-family account landscape water surveys completed during the reporting period.

### 3.1.3 CUWCC Goal

Provide leak detection assistance averaging 1.5% per year of single-family accounts and 1.5% of multi-family accounts per year for the first ten years. After meeting the 10 year 15% target, maintain the program at level of high-bill complaints or not less than 0.75% per year of current single-family accounts and 0.75% per year of current multi-family accounts. The same level of compliance will be provided for landscape surveys.

### 3.1.4 Implementation Status

The City has not yet implemented this DMM.

### 3.1.5 Existing Program

Water surveys for residential users help raise awareness of water conservation in the home and helps conserve water during everyday use. The City's Water Conservation Program was established in 1990, and during that first year, 1,732 contacts were made at residences and businesses to explain the program. The number of contacts made each year continues to grow, with more than 7,800 contacts made in the Summer of 2004 alone. Program staff members are available to set sprinkler timers upon request, adjust sprinkler heads, and provide minor advice on sprinkler systems. Staff members agree that the small amount of extra time spent assisting customers creates goodwill, ultimately reducing the likelihood of enforcement staff having to return in the future. In the past, the City has offered these free services upon request, but has not had a formal surveying program.

### 3.1.6 Future Program

Herein, the City has formalized its program for residential water surveys and landscape water surveys. Table 3-1 summarizes the estimated number of surveys to be completed over the next 10 years. The City will identify the high water users in its service and focus on those areas; service technicians and/or City interns will visit the residential users to provide leak detection assistance by performing surveys that include both indoor and outdoor investigations and to offer suggestions for both single-family and multi-family residences to improve water use efficiency. The numbers included in Table 3-1 assume residential landscape surveys will be conducted at the same time as indoor residential surveys. Surveys are offered via mailers, bill inserts and/or the City's website.

**Table 3-1: Projected Water Survey Program**

|                            | <i>FY11</i> | <i>FY12</i> | <i>FY13</i> | <i>FY14</i> | <i>FY15</i> | <i>FY16</i> | <i>FY17</i> | <i>FY18</i> | <i>FY19</i> | <i>FY20</i> |
|----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Surveys Offered            | 14,192      | 14,192      | 14,192      | 14,192      | 14,192      | 14,192      | 14,192      | 14,192      | 14,192      | 14,192      |
| # of single family surveys | 990         | 990         | 990         | 990         | 990         | 990         | 990         | 990         | 990         | 990         |
| # of multi-family surveys  | 72          | 72          | 72          | 72          | 72          | 72          | 72          | 72          | 72          | 72          |

## **3.2 DMM 2: Residential Plumbing Retrofit**

### **3.2.1 CUWCC Description**

DMM 2 provides site-specific leak detection to residential customers by providing plumbing retrofits, including showerheads and faucet-aerators that meet the current water efficiency standard as stipulated in the WaterSense Specifications (WSS).

### **3.2.2 CUWCC Documentation Requirement**

Provide reports, disaggregated by single-family and multi-family units, identifying the number of residential assistance/leak detection survey visits completed, number of WSS showerheads distributed, and number of WSS faucet aerators distributed during the reporting period.

### **3.2.3 CUWCC Goal**

Plumbing device distribution and installation programs will be maintained at a level sufficient to distribute high quality, low-flow showerheads to not less than 10% of single-family residences and 10% of multi-family units constructed prior to 1992 each reporting period; or enactment of an enforceable ordinance requiring the replacement of high-flow showerheads and other use fixtures with their low-flow counterparts. Continue until coverage includes 75% of single family and multi-family units.

### **3.2.4 Implementation Status**

The City is currently implementing this program, but has not yet achieved the CUWCC goal.

### **3.2.5 Existing Program**

The City of Modesto requires water efficient equipment to be installed in all new construction and remodels. In addition, Water Conservation Kits are distributed by the City through its Water Conservation Program. Conservation kits are also distributed after each water conservation presentation to both adults and children. Over 30,000 kits have been distributed since 1983. Each kit contains one toilet displacement bag, dye tablets to detect toilet leaks, general conservation information, and installation instructions. When using the displacement bag in a standard toilet, approximately one gallon of water is saved with each flush. It is estimated that 20 percent of all toilets leak, and that the average leak wastes nearly 47 gallons a day. Using the dye tablet will help citizens detect those leaks. The water savings from using lawn watering guides is estimated to be 20 percent per household with automatic sprinklers and 10 percent for manual systems.

### **3.2.6 Future Program**

In addition to the distribution of the Water Conservation Kits, implementation of this DMM will be combined with DMM 8, school education. As part of the school education programs discussed in DMM 8, the City will distribute low-flow showerheads to the fifth-grade classes targeted for presentations each year. Under this program, the City will aim to distribute approximately 6,000 WSS showerheads each year.

In addition to providing low-flow showerheads to the 5<sup>th</sup> grade classes under DMM 8, the City will also distribute additional low-flow showerheads as giveaways at other public events.

Table 3-2 summarizes the total number of planned low-flow showerhead giveaways provided for residential plumbing retrofits each fiscal year.

Table 3-2: Planned Residential Showerhead Retrofits

|                              | FY11  | FY12  | FY13  | FY14  | FY15  | FY16  | FY17  | FY18  | FY19 | FY20 |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| # Showerheads to SF Accounts | 4,583 | 4,583 | 4,583 | 4,583 | 4,583 | 4,583 | 4,583 | 4,583 | 0    | 0    |
| # Showerheads to MF Accounts | 1,554 | 1,554 | 1,554 | 1,554 | 1,554 | 1,554 | 1,554 | 1,554 | 0    | 0    |
| AFY savings showerheads      | 85.9  | 85.9  | 85.9  | 85.9  | 85.9  | 85.9  | 85.9  | 85.9  | 0    | 0    |

Note: Rebates for low-flow toilets will not be included in DMM 2, as DMM 14 is devoted solely to providing WSS toilets.

### 3.3 DMM 3: System Water Audits, Leak Detection, and Repair

#### 3.3.1 CUWCC Description

Per the CUWCC program, implementation of DMM 3 shall consist of at least the following actions:

1. Annually complete a pre-screening system audit to determine the need for a full-scale system-wide water audit. The pre-screening system audit shall be calculated as follows:
  - a. Determine metered sales
  - b. Determine other system verifiable uses
  - c. Determine total supply into the system
  - d. Divide metered sales plus other verifiable uses by total supply into the system (if this quantity is less than 0.9, a full scale system audit is indicated).
2. When indicated, agencies shall complete water audits of their distribution systems using methodology consistent with that described in AWWA's Water Audit and Leak Detection Guidebook.
3. Agencies shall advise customers whenever it appears possible that leaks exist on the customer's side of the meter, perform distribution system leak detection when warranted and cost-effective, and repair leaks when found.

#### 3.3.2 CUWCC Documentation Requirement

Documentation required in support of this DMM includes pre-screening audit results and supporting documentation and in-house records of audit results or the completed AWWA Audit Worksheets for each completed audit period.

#### 3.3.3 CUWCC Goal

Complete one pre-screening audit per year.

#### 3.3.4 Implementation Status

The City is currently implementing this program, but has not yet achieved the CUWCC goal.

#### 3.3.5 Existing Program

Repair and maintenance of the water distribution systems are priorities for the City. In addition to the City's Water Conservation Program, the City also has Capital Improvement Projects that provide for maintenance programs that maximize efficiency of water distribution system operations and minimize water losses. These programs include using SCADA systems to monitor groundwater and surface water production, quick responses to water main leak detection and repair, recalibration of each well meter

every four years, annual pump efficiency testing, and water quality efforts including main flushing and water quality testing.

Daily water production from the City of Modesto's wells and water treatment plant is recorded and used to monitor water use. Additionally, the City of Modesto maintains records of main breaks which are used to identify mains to be replaced and estimate system water loss.

Water Line workers (four servicemen and one supervisor) are responsible for identifying excessive water waste, standing water and system leaks. At the customer's request, City staff will investigate and, where appropriate, repair leaks within the City's right-of-way. In addition, staff conducts repairs of water line leaks and replaces or repairs meters. A repair crew will repair leaks in areas where leak detection equipment has pinpointed hidden leaks.

Each year, 25 percent of well sites are serviced and meters are recalibrated as routine maintenance. Pump efficiency tests are completed annually. Repairs are promptly made on pumps showing decreased efficiency, and well meters found to be inaccurate or exhibiting signs of wear are promptly replaced. Well efficiency is consistently tracked through the City of Modesto's SCADA System.

A Maintenance Avoidance Program was implemented in 1995 to analyze motor well vibration using a probe and recorder. This program allows the City to schedule maintenance on motors and pumps based on predictive trends calculated by the vibration analysis instruments. As a result, motors and pumps can be repaired or parts replaced before their complete failure, extending their useful life.

The City's Water Division uses Geographical Information Systems (GIS) and Global Positioning Systems (GPS) to record fire hydrant locations, valves, water meters, and to map water lines of all water distribution systems. The GIS data is organized in a database of the water system. In conjunction with the data assembled through SCADA, the database aids in hydraulic modeling of the water system. Additionally, the City uses CASS WORKS, a maintenance management system. The management system benefits the City by improving efficiency in completing work orders, managing imported records and scheduling maintenance. These programs are effective tools for providing customers with an efficiently operated and dependable water distribution system.

In the past, the City has contracted out a leak detection crew to complete a visual inspection of the system. The City Engineering staff work with City Operations crews to identify old pipelines that are leaking, and provide follow-up in replacing those lines. This is, and will continue to be, conducted as part of the City's Annual Pipe Replacement Program.

### **3.3.6 Future Program**

The City's work on its Annual Pipe Replacement Program has allowed them to identify six large areas within its service area that are problematic with high percentages of leaking due to pipe age. A schedule and budget have been developed to systematically replace the pipes in these identified areas. In addition to the City's existing program, the City will also begin conducting an annual pre-screening audit in which they will determine metered sales and other verifiable uses (in acre-feet). These amounts will be summed and divided by the total supply into the system. If the number is less than 0.9, a full water system audit will be conducted; if the number is greater than or equal to 0.9, then nothing more will be completed as part of this DMM. For the purposes of budgeting for this DMM, it was assumed that a detailed water audit will be conducted every five years.

## 3.4 DMM 4: Metering with Commodity Rates for All New Connections and Retrofit for Existing Connections

### 3.4.1 CUWCC Description

Implementation of this DMM consists of the following actions:

1. Require meters for all new service connections.
2. Establish a program for retrofitting existing unmetered service connections.
3. Read meters and bill customers by volume of use.
  - Establish and maintain billing intervals that are no greater than bi-monthly (every two months) for all customers.
  - For each metered connection, perform at least five actual meter readings (including remotely sensed) per twelve month period.
4. Prepare a written plan, policy or program that includes:
  - A census of all meters, by size, type, year installed, customer class served and manufacturer's warranty accuracy when new;
  - A currently approved schedule of meter testing and repair, by size, type and customer class;
  - A currently approved schedule of meter replacement, by size, type, and customer class; and
5. Identify intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting a feasibility study(s) to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

Service lines dedicated to fire suppression systems are exempt from this requirement.

### 3.4.2 CUWCC Documentation Requirement

Documentation required for compliance with the CUWCC MOU for DMM 4 is as follows:

- Confirmation that all new service connections are metered and are being billed by volume of use and provide:
  - Number of metered accounts
  - Number of metered accounts read
  - Number of metered accounts billed by volume of use
  - Frequency of billing (i.e. six or twelve times per year) by type of metered customer (e.g. single-family residential, multiple-family residential, commercial, industrial, and landscape irrigation)
  - Number of estimated bills per year by type of metered customer (e.g. single-family residential, multiple-family residential, commercial, industrial, and landscape irrigation) vs. actual meter readings
- Number of unmetered accounts in the service area. For the purposes of evaluation, this shall be defined as the baseline meter retrofit target and shall be used to calculate the agency's minimum annual retrofit requirement.
- Number of unmetered service connections retrofitted during the reporting period.
- Estimated number of CII accounts with mixed-use meters.
- Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.

### 3.4.3 CUWCC Goal

Meter 100% of existing unmetered accounts and bill by volume, including:

1. Initiating volumetric billing for all metered customers within one year
2. Complete meter installation for all service connections within 6 years
3. For unmetered service areas newly acquired or newly operated by otherwise metered agencies, meter installation shall be completed in these service areas within 6 years of the acquisition or operational agreement
4. A feasibility study examining incentive programs to move landscape water uses on mixed-use meters to dedicated landscape meters to be completed by the end of Year Four
5. A written plan, policy or program to test, repair and replace meters shall be completed and submitted electronically within one year

### 3.4.4 Implementation Status

The City is currently implementing this program, but has not yet achieved the CUWCC goal.

### 3.4.5 Existing Program

The City's water system is not fully metered. The City has been installing meters on new homes since the City Council enacted the Modesto Municipal Code 11-1 on May 14, 1991. Of the total 70,960 residential connections, 32,035 (as of July 2010) are unmetered. All but one of the City's non-residential services are metered, and all new development in the City since 1991 has had meters installed.

As accounts are converted to metered accounts, the City implements the rate structure shown in Table 3-12. This rate structure encourages conserving behavior by incorporating a uniform volume charge in addition to the fixed meter charge. In this way, water usage reductions directly reduce cost to the user, while excessive water use results in increased costs.

### 3.4.6 Future Program

Table 3-3 summarizes the planned commodity rate metering and retrofits for the next ten fiscal years; the City anticipates being fully metered by 2025. By developing and implementing the ongoing meter installation and replacement program, the City is developing a more focused and direct monitoring tool allowing them to detect high water usages, contributing to the implementation of DMM 1 and DMM 3. In 2009, the City budgeted two new positions in the billing division of the Finance Department, one of which is currently filled. In the future, the City will fill the other position and plans to have both positions supporting the City's meter program in a customer service role, taking phone calls, answering questions and comments, and providing information on water usage, meter installation schedule, conservation measures, and leak detection by communicating directly with homeowners. These two finance positions will also support the Water Conservation Coordinator.

**Table 3-3: Planned Commodity Rate Metering and Retrofits**

|   | <i>FY11</i> | <i>FY12</i> | <i>FY13</i> | <i>FY14</i> | <i>FY15</i> | <i>FY16</i> | <i>FY17</i> | <i>FY18</i> | <i>FY19</i> | <i>FY20</i> |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| # of meter conversions                              | 5,300       | 3,400       | 2,250       | 2,250       | 2,250       | 2,250       | 2,250       | 2,250       | 2,250       | 2,250       |
| # of accounts converted from flat to volumetric use | 5,300       | 3,400       | 2,250       | 2,250       | 2,250       | 2,250       | 2,250       | 2,250       | 2,250       | 2,250       |

## 3.5 DMM 5: Large Landscape Conservation Programs and Incentives

### 3.5.1 CUWCC Description

Under DMM 5, the City will provide support and incentives to improve non-residential customers' landscape water use efficiency. Support shall include:

1. Accounts with dedicated irrigation meters:
  - Identify accounts with dedicated meters and assign ETo-based water use budgets equal to no more than an average of 70% of ETo of annual average local ETo per square foot of landscape area.
  - Provide notices each billing cycle to accounts with water budget showing the relationship between the budget and actual consumption.
  - Offer site-specific technical assistance to reduce water use to accounts that are 20% over budget.
2. Commercial, industrial, and institutional (CII) accounts without meters or with mixed-use meters
  - Develop and implement strategy targeting large landscape water use surveys to CII accounts with mixed-use meters.
  - In un-metered service areas, actively market landscape surveys to existing accounts with large landscapes or accounts with landscapes that are not water efficient.
3. Offer financial incentives.

### 3.5.2 CUWCC Documentation Requirement:

Under this DMM, the City will preserve water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years. In addition, the following information will be preserved for CII accounts without meters or with mixed-use meters:

- Number of accounts
- Number, type, dollar value of incentives, rebates, and no- or low-interest loans offered to, and received by, customers
- Number of surveys offered
- Number of surveys accepted
- Estimated annual water savings by customers receiving surveys and implementing

### 3.5.3 CUWCC Goal

Per the CUWCC MOU (set by AB1420 as the standard for DMM compliance), the goals for DMM 5 are as follows:

- At least 90% of all dedicated meters and 15% of all mixed-use and non-metered accounts will receive assistance over a ten year period.
- Develop ETo-based water use budget for 9% of all dedicated accounts per year over 10 years.
- Offer site specific technical assistance annually to accounts that are 20% over their budget within 6 years of the date of implementation.

### 3.5.4 Implementation Status

The City has not yet implemented this DMM.

### 3.5.5 Existing Program

The City of Modesto Public Works Water Division has implemented an efficient, ETo-based irrigation system at eleven city parks. The ETo-based irrigation systems involve irrigating parks using field



computers connected by modem to a weather station. The weather station relays weather forecasts and evapotranspiration data to the field computers and the irrigation is adjusted according to incoming weather forecasts. Currently, there are plans to expand the system to include more parks and public land. The City's three certified landscape auditors oversee landscaping maintenance of the City's parks and golf courses.

The City also strives to match water quality with use. For example, the shallower aquifers in the area are generally not tapped for potable water uses due to the presence of contaminants that require treatment. The City has been evaluating the conversion of older, shallower wells or developing new shallow wells to be used exclusively for park landscaping irrigation instead of using the treated surface and groundwater sources for these demands. This strategy serves as both a cost savings to the Parks & Recreation Department and as a means by which available potable water supply sources can be conserved for potable uses. Irrigation conservation measures are still utilized at the parks, regardless of water source; but using the shallower water-bearing aquifer zones puts a supply to use that would otherwise go unused in highly urban areas. In the future, this strategy may be applied to local schools within the service area.

### 3.5.6 Future Program

In addition to the actions the City is already taking (as described in Section 3.5.5), the City also intends to begin a program to formally offer surveys to large landscape accounts. Under this program, the City will visit customers who irrigate and recommend an efficient irrigation schedule and improvements. The City will provide each dedicated irrigation account with an ETo-based water use budget equal to no more than an average of 70% of ETo of annual average local ETo per square foot of landscape area. The recreational areas, such as parks, may require additional water than allotted in the budget, but their use still may not exceed 100% of ETo on an annual basis.

To aid the customer in tracking their water use, the City will provide notices each billing cycle to the accounts with water use budgets showing the relationship between the budget and actual water consumption. The City will offer technical assistance to customers that are 20% over budget. Surveys will also be provided to commercial, industrial and institutional (CII) accounts. There is currently only one CII account that is not metered; this account will have a meter installed as part of the City's meter conversion program (DMM 4). Finally, the City will implement a weather-based irrigation controller (WBIC) rebate program, offering a \$50 rebate per WBIC purchased.

Table 3-4 summarizes the projected number of the large landscape surveys and rebates to be offered to customers under this DMM. Also shown below is the projected water savings resulting from the program implementation.

**Table 3-4: Planned Large Landscape Conservation Programs**

|                              | <i>FY11</i> | <i>FY12</i> | <i>FY13</i> | <i>FY14</i> | <i>FY15</i> | <i>FY16</i> | <i>FY17</i> | <i>FY18</i> | <i>FY19</i> | <i>FY20</i> |
|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| # of budgets created         | 84          | 84          | 84          | 84          | 84          | 84          | 84          | 84          | 84          | 84          |
| # of surveys completed       | 71          | 71          | 71          | 71          | 71          | 71          | 71          | 71          | 71          | 71          |
| # of follow-up visits        | 21          | 21          | 21          | 21          | 21          | 21          | 21          | 21          | 21          | 21          |
| # of rebates                 | 5           | 5           | 5           | 5           | 5           | 5           | 5           | 5           | 5           | 5           |
| Projected Water Savings- AFY | 164.3       | 164.3       | 164.3       | 164.3       | 164.3       | 164.3       | 164.3       | 164.3       | 164.3       | 164.3       |

## 3.6 DMM 6: High-Efficiency Clothes Washers

### 3.6.1 CUWCC Description

DMM 6 is implemented to provide incentives or establish ordinances requiring the purchase of high-efficiency clothes washing machines (HECWs) that meet an average water factor value of 5.0. If the WaterSense Specification (WSS) is less than 5.0, then the average water factor value will decrease by that amount. WaterSense is a partnership program sponsored by the U.S. Environmental Protection Agency (EPA) which makes it easier for Americans to save water by purchasing water-efficient products. Consumers can look for products with the WaterSense label to choose quality, water-efficient products. More information about WSS can be found at <http://www.epa.gov/watersense/index.htm>.

A water factor is the number of gallons per cycle per cubic foot that the clothes washer uses. The lower the water factor, the more efficient the water is. For example, if a washer uses 30 gallons per cycle and has a tub volume of 3.0 cubic feet, then the water factor is 10.

### 3.6.2 CUWCC Documentation Requirement

Documentation required for DMM 6 includes the number of installations credited to the City's replacement program for HECWs with an average water factor value of 5.0. If the WSS is less than 5.0, then the water factor value will decrease to that amount.

### 3.6.3 CUWCC Goal

Incentives shall be provided to 0.9% of current single-family accounts during the first reporting period following implementation, rising to 1% per year for the remainder of a ten year period.

### 3.6.4 Implementation Status

The City has not yet implemented this DMM.

### 3.6.5 Existing Program

MID offers \$35 rebates for energy-efficient washing machines for its qualifying electric customers and similarly, Pacific Gas & Electric (PG&E) offers \$50 rebates for energy-efficient clothes washers. Because MID and PG&E customers are also City of Modesto water customers, in the past the City has referred water users to PG&E and MID rebates available for clothes washers but did not provide their own rebates.

### 3.6.6 Future Program

The City plans to provide \$100 rebates to users towards the purchase of HECWs meeting the average WSS water factor value of 5.0 or better. As part of the implementation of this program, the City will develop and maintain a list of qualifying HECWs for residents to use. Table 3-5 summarizes program implementation and water savings.

Table 3-5: HECWs Rebate Program

|  | FY11 | FY12 | FY13 | FY14 | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 |
|--|------|------|------|------|------|------|------|------|------|------|
| # of rebates                               | 600  | 660  | 660  | 660  | 660  | 660  | 660  | 660  | 660  | 660  |
| Projected Water Savings (AFY) <sup>a</sup> | 14.7 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 |

Note: Assumes 400 loads/household/year with non-conserving washing machines using 40 gal/load and HECWs using 20 gal/load.

## 3.7 DMM 7: Public Education Programs

### 3.7.1 CUWCC Description

Public information programs shall be implemented to promote water conservation and water conservation-related benefits. Implementation shall consist of at least the following actions:

1. The program should include, when possible, providing speakers to employees, community groups and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use for the last billing period compared to the same period the year before; providing public information to promote water conservation measures; and coordinating with other government agencies, industry groups, public interest groups, and the media.
2. The program should include, when possible, social marketing elements which are designed to change attitudes to influence behavior. This includes seeking input from the public to shape the water conservation message; training stakeholders outside the utility staff in water conservation priorities and techniques; and developing partnerships with stakeholders who carry the conservation message to their target markets.
3. When mutually agreeable and beneficial, the wholesale agency or another lead regional agency may operate all or part of the public information program. If the wholesale agency operates the entire program, then it may, by mutual consent with the retail agency, assume responsibility for CUWCC reporting for this BMP. Under this arrangement, a wholesale agency may aggregate all or portions of the reporting and coverage requirements of the retail agencies joining into the mutual consent.

### 3.7.2 CUWCC Documentation Requirement

Agencies may report on all of the following activities, although agencies are only expected to meet the minimum requirements described above:

1. Newsletter articles on conservation
2. Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
3. Landscape water conservation media campaigns
4. General water conservation information
5. Website
6. Email messages
7. Website - provide link to or list of qualified landscape professionals (WaterSense, California Landscape Contractors Association, Irrigation Association, etc.) and other helpful sites
8. Direct mail - seasonal postcards noting irrigation requirement changes
9. Direct mail or other notification to customer if water use is significantly higher than neighbors with similarly-sized lots
10. Customer notification when neighbor reports runoff or runoff is noticed by employees or meter reads show rise in use of 20% or more from same time previous year
11. Dedicated phone line or "on hold" messages with recorded conservation information
12. Booths at local fairs/events
13. Monthly water use reports provided with comparison of water use to water budget
14. Presentations

15. Point of purchase pieces, including internet point of purchase by type: high-efficiency clothes washers, weather based irrigation controller, high-efficiency toilets, plant palette information, other
16. Media outreach: news releases, editorial board visits, written editorials, newspaper contacts, television contacts, radio contacts, articles or stories resulting from outreach. Provide names of local media markets: newspaper, TV stations, radio stations reached via media outreach program during the reporting period
17. Adult Education/Training Programs: Topic(s), number of presentations, number of attendees
18. Water Conservation Gardens: involvement in a garden that promotes and educates the public about water-efficient landscaping and conservation techniques. May include “corporate” or “business” sponsorship or membership
19. Sponsor or co-sponsor landscape workshops/training for homeowners and/or homeowners associations: number of presentations; number in attendance
20. Landscape watering calculator and watering index to assist with weekly irrigation scheduling
21. Additional program(s) supported by agency but not mentioned above
22. Total reporting period budget expenditure for public outreach/training/adult education programs (include all agency costs)

### **3.7.3 CUWCC Goal**

At the minimum, a public information program shall consist of the following components:

1. Contacts with the public at least four times per year
2. Water supplier contacts with media at least four times per year
3. An actively maintained website that is updated at least four times per year
4. Description of materials used to meet minimum requirement
5. Annual budget for public outreach program

### **3.7.4 Implementation Status**

The City has fully implemented this DMM and has achieved the CUWCC goal for Public Information Programs beginning in 1987.

### **3.7.5 Existing Program**

The City of Modesto’s water conservation program distributes information to the public through a variety of methods including personal contact, brochures, radio and television public service announcements, a dedicated conservation website, bill inserts, exhibits at community events, school presentations and videos. A water conservation telephone line is available to provide residents with any additional information they might request regarding water conservation. This same phone number is kept open after business hours to create a 24-hour water waste hotline.

The City of Modesto has available, upon request, numerous brochures and informational handouts on both indoor and outdoor water conservation, as well as landscape ideas incorporating the use of drought-tolerant landscaping and irrigation systems. Many of these handouts are available at the City of Modesto Utility Payment Division and the Department of Public Works at 1010 Tenth Street, and the Public Works Department Water Division at the City Corporation Yard located at 501 N. Jefferson. They are also available at the Neighborhood Preservation Unit office at 1010 Tenth Street and at each of the four Modesto Police Department Area Command offices. In addition, the City’s monthly utility bill has inserts which periodically offer water conservation tips and articles about water conservation programs. These

inserts also remind citizens of the City's outdoor watering restrictions. The City also provides water conservation information at public facilities, such as the library and City Hall, and at community gatherings such as Earth Day in the Park and the Stanislaus County Home Show.

Media coverage of the City's water conservation program is provided through public service announcements on television and radio in both English and Spanish, live interviews and taped cable television. The City's local newspaper, the *Modesto Bee*, also provides frequent and extensive coverage of current water conditions within the Modesto area.

The City has asked restaurants to serve water only upon request. Restaurants participating in the City's Water Conservation Program receive free table tent cards explaining what the program is and why it helps to save water. "Precious," the water conservation mascot, is a water drop that has participated with City staff and other local agencies in the annual Stanislaus County Home and Garden Show, Earth Day activities and the dedication of the MRWTP. City staff continue to be very active in the promotion of Water Awareness Month by having displays at the local minor league baseball team, the Modesto Nuts, games. In addition, City staff speak to numerous community service organizations such as Kiwanis, Lions Club, Boy's and Girls' Cub Scout troops, and Empire Municipal's Advisory Board. City staff has also conducted training sessions on water conservation to members of the Division and the communities of Grayson, Hickman and Salida.

Videotapes on water conservation and efficient landscaping practices are available from the Modesto Public Works Department, Water Division for use by the public. Copies of these tapes have also been donated to the Stanislaus County Library and several landscape nurseries in the City. Available films include "Water Follies" and "Beautiful Gardens with Less Water."

Within the last two years, the City has attended the Home and Garden show, Home Improvement Show, Stanislaus County Annual Retreat, Earth Day, Stanislaus County Fair, Jaycees 4th of July parade, Public Works Week, March of Dimes Walk-a-thon, made a presentation at the Kiwanis Club and all water systems municipal advisory councils. At these events, the City provides conservation kits for both children and adults providing a total of approximately 250 kits per event. There are three conservation kits the City distributes for different purposes. These include:

#### **Child's Water Conservation Kit**

- *A Water Wise* bag
- *BE WATER WISE* coloring book with crayons and stickers
- A NIAGARA water conservation "showering Coach" timer
- Water conservation website links for parents

#### **Use Water Wisely Kit**

- *Five Tips to Save Water* bag
- A use Water Wise Wheel
- *Our World of Water* activity book
- 6" Use Water Wisely Ruler
- Water Conservation website links

#### **Water Conservation Adult Kit**

- *15 Ways to Use Water Wisely* bag
- Leak detection dye tablets
- Water Conservation slide guide

- Use Water Wisely note pad.
- Water Conservation Brochures (2-4)
- Water conservation website links

The City has also coordinated with the media to better inform the public. For example, the City publishes an article in the City Beat every other month, and had various campaigns with Stott Outdoor Buses, Citadel (2 radio stations; KAT 103.3 Country and the HAWK 104.1) and Clear Channel Radio (2 stations, Sunny 102 and 96.7 FM). The City also attends County Municipal Advisory meetings, some of which are televised, and provides information. The City will continue these efforts into the future. Examples of the public outreach and school education materials are included in Appendix A.

### 3.7.6 Future Program

The City will continue to implement public outreach strategies as described in their Existing Program for this DMM. The number of each planned activity per fiscal year is shown in Table 3-6.

**Table 3-6: Planned Public Education Programs**

|                            | FY11 | FY12 | FY13 | FY14 | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 |
|----------------------------|------|------|------|------|------|------|------|------|------|------|
| Public Presentations/Demos | 6    | 6    | 6    | 6    | 6    | 6    | 6    | 6    | 6    | 6    |
| Contacts with Media        | 12   | 12   | 12   | 12   | 12   | 12   | 12   | 12   | 12   | 12   |
| Commercial/Radio Ads       | 650  | 650  | 650  | 650  | 650  | 650  | 650  | 650  | 650  | 650  |
| Update website             | 4    | 4    | 4    | 4    | 4    | 4    | 4    | 4    | 4    | 4    |

## 3.8 DMM 8: School Education Programs

### 3.8.1 CUWCC Description

School education programs are implemented to reach the youngest water users at an early age and enforce the need to engage in water conservation as a life-long behavior. Implementation shall consist of at least the following actions:

1. Implement a school education program to promote water conservation and water conservation-related benefits.
2. Programs shall include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Educational materials shall meet the state education framework requirements and grade-appropriate materials shall be distributed.
3. When mutually agreeable and beneficial, the wholesale agency or another lead regional agency will operate all or part of the education program; if the wholesale agency operates all or part of the retail agency's school education program, then it may, by mutual consent with the retail agency, assume responsibility for CUWCC reporting of this BMP; under this arrangement, a wholesale agency may aggregate all or portions of the reporting and coverage requirements of the retail agencies joining into the mutual consent.

As part of this DMM, an active school education program should be maintained to educate students in their service area about water conservation and efficient water use. An agency or other local entity may participate in a mutual arrangement as described above.

### 3.8.2 CUWCC Documentation Requirement

Agencies may report on all of the following activities, although they are only expected to meet the minimum requirements described above:

1. Classroom presentations: number of presentations, number of attendees, topics covered: conservation, recycled water, water sources, pollution prevention, etc.
2. Large group assemblies: number of presentations, number of attendees
3. Children's water festivals or other events: number of presentations, number of attendees
4. Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up: number of presentations, number of attendees
5. Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits); Description; number distributed
6. Staffing children's booths at events & festivals: number of booths, number of attendees
7. Water conservation contests such as poster and photo: description, number of participants
8. Offer monetary awards/funding or scholarships to students: number offered, total funding
9. Teacher training workshops: number of presentations, number of attendees
10. Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.: number of tours or field trips, number of participants
11. College internships in water conservation offered: number of internships, total funding
12. Career fairs/workshops: number of presentations, number of attendees
13. Additional program(s) supported by agency but not mentioned above: description, number of events (if applicable), number of participants
14. Total reporting period budget expenditures for school education programs (include all agency costs)

### 3.8.3 CUWCC Goal

The following are the goals for obtaining compliance with this DMM:

1. Curriculum materials developed and/or provided by agency (including confirmation that materials meet state education framework requirements and are grade-level appropriate).
2. Materials distributed to K-6 students. When possible, school education programs will reach grades 7-12 as well.
3. Description of materials used to meet minimum requirement.
4. Annual budget for school education program.
5. Description of all other water supplier education programs.

### 3.8.4 Implementation Status

The City has fully implemented this DMM and has achieved the CUWCC goal for School Education Programs beginning in 1987.

### 3.8.5 Existing Program

Each year, City staff gives school presentations to students at elementary schools in Modesto's service area. Also, in past years, the Water Conservation Coordinator has met with school district principals to encourage participation in the program as it focuses on water conservation while incorporating state content standards. Two American Water Works Association (AWWA) publications, "Splash" and the

“Story of Water,” as well as the video “Water Follies,” are used in conjunction with school programs and other community events. Elementary school students are particularly receptive to the conservation message and they share that message with their parents. Though fifth graders are targeted with the school presentations, similar presentations are given to junior and high school students upon request. As part of the program, Water Conservation Kits are distributed to the students. In the last two years, the City has distributed over 250 kits to City of Modesto classrooms. School education materials, which at times are used for public education as part of DMM 7 are included in Appendix A.

### 3.8.6 Future Program

The City will continue to implement their School Education Program as described in Section 3.8.5. Each student will be given a conservation kit that also includes a low-flow showerhead (in conjunction with DMM 2) to install in their own homes with their parents’ permission. Table 3-7 summarizes the planned school education presentations to fifth grade classes and the estimated water savings that may result from the low-flow showerhead distribution.

**Table 3-7: Planned School Education Presentations**

|                     | <i>FY11</i> | <i>FY12</i> | <i>FY13</i> | <i>FY14</i> | <i>FY15</i> | <i>FY16</i> | <i>FY17</i> | <i>FY18</i> | <i>FY19</i> | <i>FY20</i> |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| # of kit giveaways  | 125         | 125         | 125         | 125         | 125         | 125         | 125         | 125         | 125         | 125         |
| # presentations     | 5           | 5           | 5           | 5           | 5           | 5           | 5           | 5           | 5           | 5           |
| total water savings | 1.8         | 1.8         | 1.8         | 1.8         | 1.8         | 1.8         | 1.8         | 1.8         | 1.8         | 1.8         |

Note: The cost of showerheads included in DMM 2.

## 3.9 DMM 9: Commercial, Industrial, and Institutional

### 3.9.1 CUWCC Description

Commercial, industrial, and institutional (CII) water use varies dramatically between business sectors and location. This DMM includes implementing measures to achieve a water savings. Potential measures include, but are not limited to:

- Industrial process water use reduction
- Industrial laundry retrofits
- Car wash recycling systems
- Water efficient commercial dishwashers
- Wet cleaning

### 3.9.2 CUWCC Documentation Requirement

Required documentation for DMM 9 includes reporting the measure type and quantity installed, as well as water savings attributed to water shortage measures, intervention and actions.

### 3.9.3 CUWCC Goal

The CUWCC goal is to save 10% of baseline CII water use over a 10-year period by reducing water use as follows:

- 0.5% by end of first reporting period (i.e. year 2)
- 2.4% by the end of year 4
- 4.3% by the end of year 6
- 6.4% by the end of year 8
- 9% by the end of year 10



Table 3-8: Demonstrated CII Water Savings<sup>1</sup>

| Measure                                   | Annual Savings (AF)               | Measure Life (years) |
|---|-----------------------------------|----------------------|
| HE Toilets                                | 0.041748                          | 25                   |
| HE Urinals                                | 0.069086                          | 25                   |
| Ultra Low Volume Urinals                  | 0.080603                          | 25                   |
| Zero Consumption Urinals                  | 0.0921146                         | 25                   |
| Commercial HE Single Load Clothes Washers | 0.116618                          | 10                   |
| Cooling Tower Conductivity Controllers    | 1.032250                          | 5                    |
| Cooling Tower ph Controllers              | 3.981543                          | 5                    |
| Connectionless Food Steamers              | Per Steamer<br>Compartment – 0.25 | 10                   |
| Medical Equipment Steam Sterilizers       | 1.538                             | 20                   |
| Water-Efficient Ice Machines              | 0.834507                          | 10                   |
| Pressurized Water Brooms                  | 0.1534                            | 5                    |
| Dry Vacuum Pumps                          | 0.64                              | 7                    |

1. Source: CUWCC MOU Regarding Urban Water Conservation (December 2008)

### 3.9.4 Implementation Status

The City has not yet implemented this DMM.

### 3.9.5 Existing Program

Historically, the City has provided water use audits to any CII customer upon request as an informal service, but historical records have not been kept. The City implements two different strategies, one for new CII accounts and one for existing CII accounts. For new users, the City works to inform the user of potential wastewater saving measures by having them conduct a self-audit of their operations and equipment. This effort can save the user wastewater connection charges in addition to reducing their water consumption per square foot of operation. The City plans to develop tools and information sources to inform new CII customers of these potential savings. For existing CII users, a similar effort can be developed to display the economic savings through self-audits. It is estimated the savings on both the water and wastewater side will offset the cost of the self-audit in a short time. In the future, the City may have staff attend training that would increase their knowledge of such water saving measures. Currently, the City's Environmental Compliance Division, who handles wastewater discharge permits among other regulatory tasks, is instrumental in assisting larger CII users with water savings measures to reduce wastewater discharge impacts.

### 3.9.6 Future Program

Currently, the City has about 4,712 CII accounts, one of which is unmetered and will be retrofitted under DMM 4. Under this DMM, the City will develop a formal survey program for CII accounts that will consist of free water use surveys (performed upon request) and evaluations of water using apparatus and processes, as well as recommended efficiency measures.

Table 3-9 summarizes the projected CII conservation program. Rebates could be provided for some water saving devices such as those included in Table 3-10. Also, in the future, the City anticipates adopting the Commercial Green Building Code which will provide for higher water use efficiency standards (i.e. 20% reduction).

**Table 3-9: Estimated CII Programs**

|                               | <i>FY11</i> | <i>FY12</i> | <i>FY13</i> | <i>FY14</i> | <i>FY15</i> | <i>FY16</i> | <i>FY17</i> | <i>FY18</i> | <i>FY19</i> | <i>FY20</i> |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| # of on-site surveys          | 100         | 100         | 100         | 100         | 100         | 100         | 100         | 100         | 100         | 100         |
| # of rebates provided         | 30          | 75          | 150         | 255         | 200         | 220         | 220         | 220         | 270         | 295         |
| # of follow-up visits         | 30          | 30          | 30          | 30          | 30          | 30          | 30          | 30          | 30          | 30          |
| Projected water savings - AFY | 23.4        | 58.5        | 117.0       | 198.9       | 156.0       | 171.6       | 171.6       | 171.6       | 210.6       | 230.1       |

**Table 3-10: City CII Rebates**

| <b>Device</b>                             | <b>Incentive Amount</b> |
|---|-------------------------|
| High Efficiency (HE) Toilets              | \$200                   |
| HE Urinals                                | \$200                   |
| Ultra Low Volume Urinals                  | \$200                   |
| Zero Consumption Urinals                  | \$200                   |
| Commercial HE Single Load Clothes Washers | \$200                   |
| Cooling Tower Conductivity Controllers    | \$400                   |
| Cooling Tower pH Controllers              | \$400                   |
| Connectionless Food Steamers              | \$400                   |
| Medical Equipment Steam Sterilizers       | \$400                   |
| Water-Efficient Ice Machines              | \$250                   |
| Pressurized Water Brooms                  | \$125                   |
| Dry Vacuum Pumps                          | \$125                   |

### 3.10 DMM 10: Wholesale Agency Programs

The City is not a wholesale water agency and therefore is not required to implement DMM 10.

### 3.11 DMM 11: Retail Conservation Pricing

#### 3.11.1 CUWCC Description

DMM 11 promotes water conserving retail water rate structures. This DMM recognizes that each agency or water enterprise fund has a unique rate setting system and history. When creating a rate case, professional judgments are made to determine whether costs are accounted to a variable or fixed cost center by the staff of the agency. The final water rate case is an accumulation of all the decisions and judgments made by staff and supplemented by the financial projections leading an agency to establish its

final water rate recommendation. DMM 11 is not intended to supplant this process, but rather to reinforce the need to establish a strong nexus between volume-related system costs and volumetric commodity rates.

DMM 11 also applies to retail sewer service. Conservation pricing of sewer service provides incentives to reduce average or peak use, or both. Such pricing includes rates designed to recover the cost of providing service, and billing for sewer service based on metered water use. Conservation pricing of sewer service is also characterized by one or more of the following components: rates in which the unit rate is the same across all units of service (uniform rates); rates in which the unit rate increases as the quantity of units purchased increases (increasing block rates); rates in which the unit rate is based upon the long-run marginal cost or the cost of adding the next unit of capacity to the sewer system. Rates that charge customers a fixed amount per billing cycle for sewer service regardless of the units of service consumed do not satisfy the definition of conservation pricing of sewer service. Rates in which the typical bill is determined by high fixed charges and low commodity charges also do not satisfy the definition of conservation pricing of sewer service.

Conservation pricing requires volumetric rates. While this DMM defines a minimum percentage of water sales revenue from volumetric rates, the goal of this DMM is to recover the maximum amount of water sales revenue from volumetric rates that is consistent with utility costs (which may include utility long-run marginal costs), financial stability, revenue sufficiency, and customer equity. In addition to volumetric rates, conservation pricing may also include one or more of the following other charges:

1. Service connection charges designed to recover the separable costs of adding new customers to the water distribution system.
2. Monthly or bimonthly meter/service charges to recover costs unrelated to the volume of water delivered or new service connections and to ensure system revenue sufficiency.
3. Special rates and charges for temporary service, fire protection service, and other irregular services provided by the utility.

The following volumetric rate designs are potentially consistent with the above definition:

1. Uniform rate in which the volumetric rate is constant regardless of the quantity consumed.
2. Seasonal rates in which the volumetric rate reflects seasonal variation in water delivery costs.
3. Tiered rates in which the volumetric rate increases as the quantity used increases.
4. Allocation-based rates in which the consumption tiers and respective volumetric rates are based on water use norms and water delivery costs established by the utility.

**Adequacy of Volumetric Rates:** A retail agency's volumetric rate shall be deemed sufficiently consistent with the definition of conservation pricing when it satisfies at least one of the following two options.

- Option 1: Let V stand for the total annual revenue for the volumetric rate(s) and M stand for total annual revenue from customer meter/service (fixed) charges, then:

$$\frac{V}{(V+M)} \geq 70\%$$

This calculation shall only include utility revenues from volumetric rates and monthly or bimonthly meter/service charges. It shall not include utility revenues from new service connection charges; revenue from special rates and charges for temporary service, fire protection, or other irregular services; revenue from grants or contributions from external sources in aid of construction or program implementation; or revenue from property or other utility taxes.

- Option 2: Use the rate design model included with the Municipal Water and Wastewater Rate Manual published by the Canadian Water & Wastewater Association with the signatory's water system and cost information to calculate V', the uniform volumetric rate based on the signatory's

long-run incremental cost of service, and M', the associated meter charge. [Let HCF be annual water delivery (in hundred cubic feet).] The volumetric rate(s) shall be deemed sufficiently consistent with the definition of conservation pricing if:

$$\frac{V}{(V+M)} \geq \frac{V'}{(V'+M')}$$

The rate design model can be downloaded at <http://www.cuwcc.org/resource-center/technical-resources/bmp-tools.aspx>.

This calculation only includes utility revenues from volumetric rates and monthly or bimonthly meter/service charges. It does not include utility revenues from new service connection charges; revenue from special rates and charges for temporary service, fire protection, or other irregular services; revenue from grants or contributions from external sources in aid of construction or program implementation; or revenue from property or other utility taxes.

As part of this DMM, a rate structure that satisfies at least one of the options specified above needs to be maintained. Conformance to Option 1 or Option 2 will first be assessed using the revenue from the most recent year. If the most recent year does not satisfy the option, the average revenue from the three (3) most recent years will be used.

### 3.11.2 CUWCC Documentation Requirement

For water, provide the following:

1. Report the rate structure in effect for each customer class for the reporting period.
2. Report the annual revenue derived from volume charges for each retail customer class, as defined above. (Note: Compliance with BMP 11 will be determined based on the City's total revenue from all retail customer classes.)
3. Report the annual revenue derived from monthly or bimonthly meter/service charges for each retail customer class, as defined above.
4. If agency does not comply with Option 1 in Section A, report v' and m' as determined by the Canadian Water & Wastewater Association rate design model described above.
5. If agency does not comply with Option 1 in Section A, submit the completed Canadian Water & Wastewater Association rate design model described above.

For sewer, provide the following:

1. Report annual revenue requirement for sewer service by customer class for the reporting period.
2. Report annual revenue for sewer service from commodity charges by customer class for the reporting period.
3. Report rate structure by customer class for sewer service.

### 3.11.3 CUWCC Goal

The CUWCC goal for DMM 11 varies depending on the option for volumetric pricing selected. Table 3-11 summarizes the CUWCC goals.

Table 3-11: CUWCC Goals for DMM 11

| Years After Start Year | For Option 1                               | For Option 2  |
|------------------------|--|---|
| 1                      | $\frac{V}{(V+M)} > 70\% \quad \times 0.70$ | $\frac{V}{(V+M)} > \frac{V'}{(V'+M')} \quad \times 0.7$ |
| 2                      | $\frac{V}{(V+M)} > 70\% \quad \times 0.80$ | $\frac{V}{(V+M)} > \frac{V'}{(V'+M')} \quad \times 0.8$ |
| 3                      | $\frac{V}{(V+M)} > 70\% \quad \times 0.90$ | $\frac{V}{(V+M)} > \frac{V'}{(V'+M')} \quad \times 0.9$ |
| 4                      | $\frac{V}{(V+M)} > 70\% \quad \times 1.00$ | $\frac{V}{(V+M)} > \frac{V'}{(V'+M')} \quad \times 1.0$ |

**3.11.4 Implementation Status**

The City is currently implementing this program, but has not yet achieved the CUWCC goal of

$$\frac{V}{(V+M)} > 70\%.$$

**3.11.5 Existing Program**

The Modesto City Council adopted Resolution 2000-45, which established charges for metered and unmetered services as of February 1, 2000. The rate structure was designed to promote conservation, with metered services paying a flat monthly service charge if water usage was kept below 1,680 cubic feet per month, or approximately 419 gallons per day. Water usage over this amount was charged an additional 82 cents for every 100 cubic feet (25 gallons) used. In addition, administrative fees were assessed upon second violations of restricted outdoor water use and repair of identified water leaks within 24 hours. The third and all subsequent violations required mandatory meter installation in addition to the administrative fee.

In 2005, the City converted from a three-zone structure that was adopted when the City purchased Del Este Water Company in 1995 to a uniform rate structure across all zones. Under this revised rate structure, metered accounts pay the current uniform volume charge of \$1.31/hundred cubic feet. The City’s current rate structure is shown in Table 3-12.

Table 3-12: City of Modesto Current Water Rates and Charges

| Meter Size                                     | Water Rate |
|--|------------|
| Flat Rate Residential – Monthly Service Charge |            |
| 0 – 5,000 sq ft lot                            | \$40.29    |
| 5,001 to 7,000 sq ft lot                       | \$45.79    |
| 7,001 to 11,000 sq ft lot                      | \$54.34    |
| 11,001 to 17,000 sq ft lot                     | \$57.69    |
| Over 17,000 sq ft lot                          | \$67.82    |
| Metered Charge (Residential & Commercial)      |            |
| Uniform Volume Charge (\$/hcf)                 | \$1.31     |
| Fixed Meter Charges                            |            |
| 5/8 inch to ¾ inch                             | \$14.00    |
| 1 inch   | \$19.86    |
| 1 ½ inch                                       | \$34.37    |
| 2 inch   | \$51.86    |
| 3 inch   | \$98.54    |
| 4 inch   | \$150.99   |
| 6 inch   | \$296.61   |
| 8 inch   | \$471.45   |
| 10 inch  | \$675.47   |
| 12 inch  | \$1,258.19 |

Conservation pricing requires volumetric rates, so metered service is a necessary condition. The City is implementing its Meter Conversion Program in which it is installing meters at unmetered accounts and replacing (converting) existing old meters with new automatic read models. Once the meter has been installed, the City begins charging volumetrically, using a uniform volume charge as shown in Table 3-12.

The City's calculated  $V/(V+M)$  currently equals 52%. V is equal to the total annual revenue from volumetric rates and M equals the total annual revenue from customer service (fixed) charges. For the City, V is equal to \$13.8 million and M is equal to \$12.7 million. The City is currently meeting the requirement for Year 1 for Option 1, as 52% is greater than  $0.7 \times 70\%$  (or 49%).

### 3.11.6 Future Program

The City will continue to charge volumetric pricing and increase the volumetric component until full coverage is achieved, estimated to occur in 2014. As required, the City will evaluate the need to readjust rates in order to ensure continued compliance for this DMM.

## 3.12 DMM 12: Water Conservation Coordinator

### 3.12.1 CUWCC Description

Under DMM 12, a person is designated as the agency's responsible conservation coordinator for program management, tracking, planning, and reporting on BMP implementation. Coverage consists of staffing

and maintaining the position of trained conservation coordinator, or equivalent consulting support, and providing that function with the necessary resources to implement BMPs.

### **3.12.2 CUWCC Documentation Requirement**

Provide the contact information for the conservation coordinator, or consultant assigned, and verification that the position is responsible for implementing the tasks identified above.

### **3.12.3 CUWCC Goal**

Staff and maintain a position of a trained conservation coordinator.

### **3.12.4 Implementation Status**

The City has fully implemented this DMM and has achieved the CUWCC goal.

### **3.12.5 Existing Program**

A full-time water conservation coordinator position was authorized by the City Council and was filled in 2001. This position remains filled today. The Water Conservation Coordinator's role is to develop, implement and manage the City of Modesto's water conservation program and to coordinate with ongoing conservation programs in other departments and other agencies. The Water Conservation Coordinator runs school education outreach programs; trains and directs activities of other staff assigned to water conservation functions; provides conservation information to residents and commercial businesses, coordinates the development of uniform conservation policies and enforcement; develops, recommends and maintains various media sources for providing conservation information to both internal and external customers; plans, coordinates and administers various day-to-day activities pertaining to the City's Water Conservation Program; promotes the efficient use of the City's water supply by residential, irrigation, industrial, commercial public agencies and other customers to ensure sufficient pressure throughout the system for fire protection and other essential City services; investigates and identifies compliance issues; and communicates with regulatory agencies as required.

### **3.12.6 Future Program**

The City will continue to keep the position of the Conservation Coordinator filled. Additionally, the City has budgeted for an additional technical position in which a person could be hired to provide assistance to the Water Conservation Coordinator, most likely with the specific implementation of DMM 1 and DMM 2.

## **3.13 DMM 13: Water Waste Prohibition**

### **3.13.1 CUWCC Description**

The CUWCC describes this DMM as applying in three different ways:

1. New development – Enact, enforce, or support legislation, regulations, ordinances, or terms of service that (1) prohibit water waste such as, but not limited to: single-pass cooling systems; conveyer and in-bay vehicle wash and commercial laundry systems which do not reuse water; non-recirculating decorative water fountains and (2) address irrigation, landscape, and industrial, commercial, and other design inefficiencies.
2. Existing users – Enact, enforce, or support legislation, regulations, ordinances, or terms of service that prohibit water waste such as, but not limited to: landscape and irrigation inefficiencies, commercial or industrial inefficiencies, and other misuses of water.
3. Water shortage measures – Enact, enforce, or support legislation, regulations, ordinances, or terms of service that facilitate implementation of water shortage response measures.

To successfully implement this DMM, one or more of the following must be implemented:

- a) Enact and enforce an ordinance or establish terms of service that prohibit water waste
- b) Enact and enforce an ordinance or establish terms of service for water efficient design in new development
- c) Support legislation or regulations that prohibit water waste
- d) Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures
- e) Support local ordinances that prohibit water waste
- f) Support local ordinances that establish permits requirements for water efficient design in new development.

### 3.13.2 CUWCC Documentation Requirement

Documentation requirements for DMM 13 include the following:

- A description of, or electronic link to, any ordinances or terms of service adopted by water agency to meet the requirements of this BMP
- A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.
- A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement consistent with this BMP.
- A description of agency support positions with respect to adoption of legislation or regulations consistent with this BMP.

### 3.13.3 CUWCC Goal

Adopt and enforce a water waste ordinance.

### 3.13.4 Implementation Status

The City has implemented this DMM through its adoption of a water conservation policy that supports local ordinance that prohibit water waste.

### 3.13.5 Existing Program

On March 25, 2003, City Council adopted Resolution No. 2003-162 which approved the implementation of Stage I of the City's Drought Contingency Plan (see Appendix B). Any violations of the rules and regulations established as part of Stage I Drought Contingency Plan are considered water waste. The rules and regulations are as follows:

1. Outdoor water use shall be prohibited daily from 12:00 p.m. to 7:00 p.m.
2. Odd-numbered addresses shall water outdoors only on Wednesdays, Fridays, and Sundays.
3. Even-numbered addresses shall water outdoors only on Tuesdays, Thursdays, and Saturdays.
4. No outdoor water use is permitted on Mondays.
5. City residents shall not wash cars without the use of a quick-acting positive shut-off nozzle or permit others to do so on their behalf. In addition, car washing must be done in compliance with the schedule for outdoor water use. There shall be no washing of building exteriors, mobile home exteriors, recreational vehicle exteriors, sidewalks, patios, driveways, gutters, or other exterior surfaces unless a permit is issued by the Public Works Director or his designee and the washing is done with a quick-acting positive shut-off nozzle on the hose.



6. City residents shall not have leaky faucets or plumbing fixtures on their premises for more than 24-hours after the leak has been identified or notice has been received from the City, whichever comes first.
7. Eating establishments are encouraged to serve water only at the customer’s request.
8. New landscaping installations must comply with all applicable landscape ordinances.
9. Exceptions to the regulations set forth herein may be made by the Public Works Director or his authorized designee upon a showing of good cause and necessity.
10. The following penalties may be added to the utility service customer’s account upon violation of the above regulations:
  - a. A penalty in the sum of \$50 upon the second violation within one year after having received a Notice of Violation.
  - b. A penalty of \$200 upon the third violation within said one-year period.
    - i. Upon the third violation within one year of having received a Notice of Violation, the resident shall also have a water meter installed if one is not present and metered billing shall commence.
  - c. A penalty of \$250 upon the fourth and any subsequent violations within said one-year period.
  - d. The customer shall be advised of these charges through a Notice of Intention to Impose a Penalty.

**3.13.6 Future Program**

The City will continue to enforce its water waste ordinance by having the Public Works Department perform site visits, as shown in Table 3-13.

**Table 3-13: Water Waste Ordinance Enforcement**

|                            | FY11  | FY12  | FY13  | FY14  | FY15  | FY16  | FY17  | FY18  | FY19  | FY20  |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Waste ordinance in effect? | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| # on-site visits           | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |

**3.14 DMM 14: WaterSense Specification (WSS) Toilets**

**3.14.1 CUWCC Description**

Under DMM 14, the City will provide financial incentives or ordinances requiring the replacement of existing toilets using 3.5 or more gallons per flush (gpf) with a toilet meeting WaterSense Specifications. WSS high efficiency toilets use a maximum of 1.28 gpf, which is 20% less than the current federal standard of 1.6 gpf. Ultra low-flow toilets (ULFT) differ in that they cannot be WSS certified as they do not save as much water. Numerous toilets have been certified to meet the WSS criteria and retailers are committed to making them available in stores. A complete list of certified toilets can be accessed here:

[http://www.epa.gov/WaterSense/pp/find\\_het.htm](http://www.epa.gov/WaterSense/pp/find_het.htm).

**3.14.2 CUWCC Documentation Requirement**

Documentation requirements for DMM 14 include a description of the program and the number of WSS toilet installations credited to the City’s replacement program disaggregated by single-family or multi-family units.

**3.14.3 CUWCC Goal**

Demonstrate a number of toilet replacements of 3.5 gpf or greater, toilets at or above the level achieved through a retrofit on resale ordinance until 2014, or a market saturation of 75% is demonstrated, whichever is sooner.

**3.14.4 Implementation Status**

The City has not yet implemented this DMM.

**3.14.5 Existing Program**

The State of California passed legislation requiring all toilets sold and installed after January 1, 1994 to be ultra-low flush toilets (ULFT) using no more than 1.6 gallons per flush. There have been approximately 9,000 homes built in the City of Modesto water service area since January 1994 equipped with ultra-low flush toilets. In addition to the new home construction, an unknown number of pre-1994 toilets have been replaced with ultra-low flush toilets. The City has not implemented a formal rebate program to provide financial incentive for customers to meet the WaterSense Specifications.

**3.14.6 Future Program**

The City's future WSS toilet replacement program may take one or more forms. Two potential options include the City offering \$50 rebates on customer purchases of qualifying toilets and/or the City hiring a firm to manage implementation of this DMM in coordination with the City. The program could also include the use of city facilities and/or schools as drop-off and distribute sites for the WSS toilets. Coordination with other organizations may come in the form of utilizing volunteers. Furthermore, in the future, the City may adopt a retrofit-on-resale ordinance, but at this time the City is looking to provide \$50 rebates as incentives instead. Table 3-14 summarizes the planned program costs and water savings.

**Table 3-14: Single Family WSS Toilet Replacement Program**

|  | <i>FY11</i> | <i>FY12</i> | <i>FY13</i> | <i>FY14</i> | <i>FY15</i> | <i>FY16</i> | <i>FY17</i> | <i>FY18</i> | <i>FY19</i> | <i>FY20</i> |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| # of rebates                               | 50          | 75          | 100         | 125         | 150         | 175         | 200         | 225         | 250         | 275         |
| Projected Water Savings (AFY) <sup>a</sup> | 1.5         | 2.2         | 2.9         | 3.6         | 4.4         | 5.1         | 5.8         | 6.6         | 7.3         | 8.0         |

Note: Assumes 2.5 people per household with non-conserving toilets using 18.7 gal/day/person and WSS toilet using 8.3 gal per day per person.

## References

California Department of Water Resources, Office of Water Use Efficiency. 2009. *Compliance with AB1420 Requirements*.

California Urban Water Conservation Council. 2008. *Memorandum of Understanding Regarding Urban Water Conservation in California*. December 10.

California Urban Water Conservation Council. 2010. *Memorandum of Understanding Regarding Urban Water Conservation in California*. June 9.

RMC Water and Environment. 2007. *City of Modesto / Modesto Irrigation District Joint Urban Water Management Plan 2005 Update*. May.

[http://www.ci.modesto.ca.us/pwd/utilities/water/conservation/city\\_restrictions.asp](http://www.ci.modesto.ca.us/pwd/utilities/water/conservation/city_restrictions.asp)

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**Appendix A - School Educational and Public Outreach  
Materials Examples**

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## Parent/Student Water Conservation Checklist

### INDOOR USE

#### Bathrooms



**1**

Have toilets been checked for leaks?

Yes  
 No

#### Suggestions

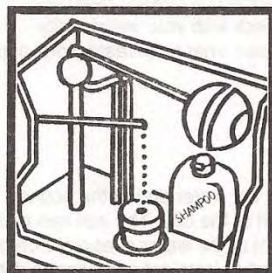
Place a few drops of food coloring in toilet tank (be sure the water is clear, not colored by in-toilet cleaning dispensers).

**2**

Is the toilet being used as a wastebasket?

Yes  
 No

Extra toilet flushes can waste as much as 5 plus gallons each.

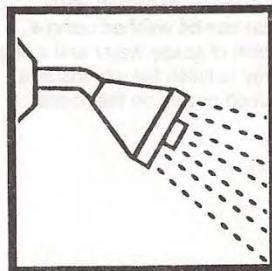


**3**

Is there either a plastic bottle or bag in the toilet tank so that each flush uses less water?

Yes  
 No

If you have an older model toilet, put an inch or two of sand or pebbles in the bottom of a one-quart plastic bottle (an empty plastic shampoo bottle works well) and fill the rest of the bottle with water. Cap the bottle tightly. Place the bottle in the toilet tank, safely away from all moving parts. Better yet, consider buying a new ultra-low flow toilet which uses 1.6 gallons per flush (instead of up to 5 plus gallons per flush). See your hardware or plumbing store or contact your local water agency for further information.



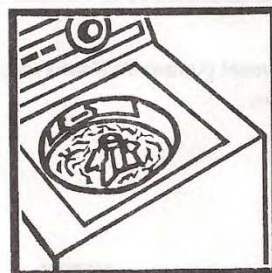
**4**

Are family members taking short showers (5 minutes or less)?

Yes  
 No

Taking quicker showers can help you save up to 3 gallons of water for each minute of shower time reduced. Consider installing a new low-flow shower head which uses 2.5 gallons per minute.

#### Kitchen/Laundry

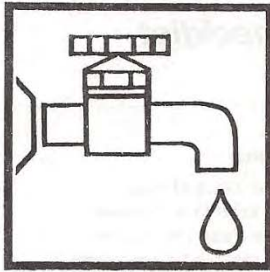


**5**

Are dishwashers and washing machines used only with full loads?

Yes  
 No

Wait until full loads before using appliances. This saves water and energy.



**6** Is water left running while rinsing vegetables, dishes, shaving or brushing teeth?

Yes  
 No

**7** Have kitchen and all other faucets been checked for leaks?

Yes  
 No

**Suggestions**

Ponding water (keeping it in the sink with a stopper) is a smart way to conserve water.

Repair leaks as soon as possible. Even small leaks add up to large losses over time.

**OUTDOOR USE**



**8** Is the landscape watered only when the plants really need water?

Yes  
 No

**9** Is the landscape being watered before 10:00 a.m. or after 5:00 p.m.?

Yes  
 No

Check lawns and shrubs to see if they need water. A lawn that springs back after being stepped on doesn't need water. Check with your water utility to see what local restrictions apply.

Do not water during the hottest part of the day. The sun can make a lot of the water evaporate before thirsty plants get a chance to drink it.



**10** Are your walkways or driveways hosed off for cleaning?

Yes  
 No

Using a broom gets the cleaning job done while saving water, too. A car can be washed using a bucket of soapy water and a fine spray to finish the job. Install a shut-off nozzle on the hoses.

*I have reviewed the water-saving tips mentioned above with my son/daughter.*

Parent's Signature \_\_\_\_\_

**Local hardware and plumbing stores stock many devices to help you save water and meet current California law. Contact your local water agency for more information on water conservation programs.**



PRINTED BY  
DEPARTMENT OF WATER RESOURCES  
REPROGRAPHICS

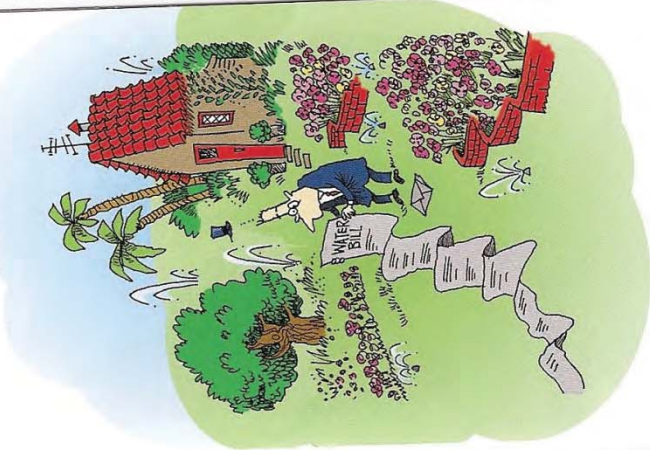


**SLOW**  
the flow.

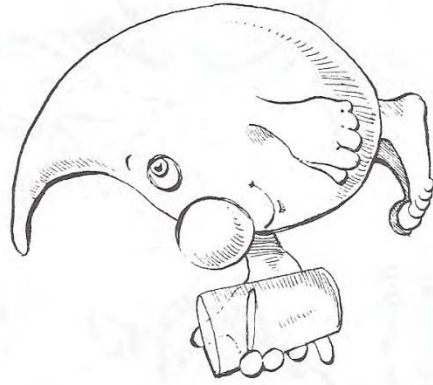


Tips to conserve water  
in your lawn and garden.

**A Consumer's Guide to  
Water Conservation**  
**The Outside Story**



**Coloring  
Fun for  
Little Water  
Users**



CITY OF MODESTO  
Water Conservation Program

**NOTICE**

Case Number: \_\_\_\_\_

Time: \_\_\_\_\_ AM/PM

Date of Notice: \_\_\_\_\_

Address: \_\_\_\_\_

The following was noted on your property:

- Flooded areas, including gutters
- Water running or spraying off property
- Outdoor water use on the wrong day
- Outdoor water use during restricted hours
- Washing car without shutoff nozzle
- Washing concrete, building, etc... without City permit
- Repairs and adjustments \_\_\_\_\_
- Other Comments \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

For information regarding this **NOTICE**, please call:

City of Modesto Water Division  
(209) 342-2246

This is a **NOTICE**. However, if additional instances occur within 12 months of this **NOTICE**, a violation could be given to you and penalties added to your water/sewer bill from the City of Modesto.



Be a  
**WISER WATER MISER**  
CITY OF MODESTO

**A Consumer's Guide to  
Water Conservation**

***The Inside Story***

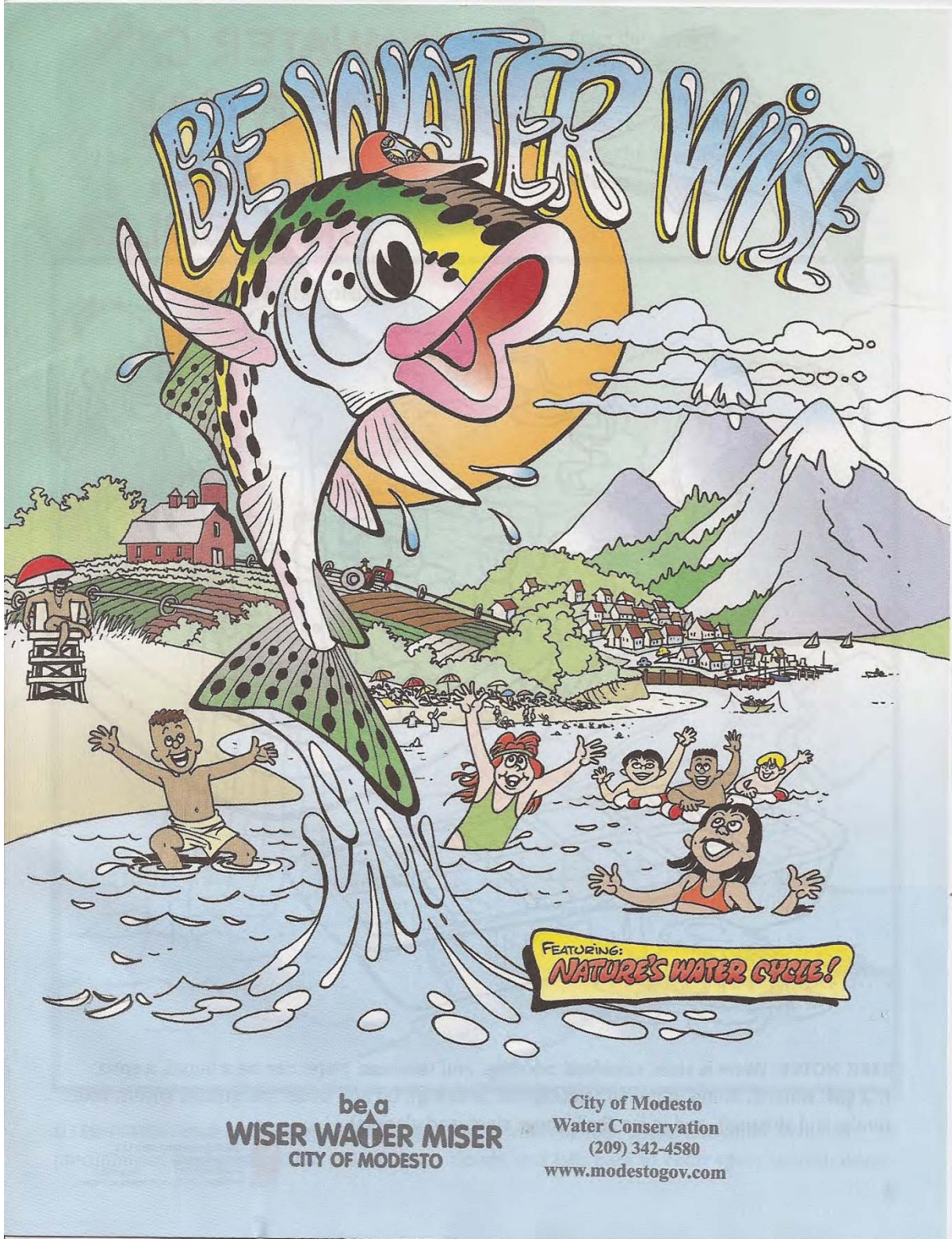




CITY of MODESTO

*Water-Wise  
Gardening Guide*





be a  
**WISER WATER MISER**  
CITY OF MODESTO

City of Modesto  
Water Conservation  
(209) 342-4580  
[www.modestogov.com](http://www.modestogov.com)



# Easy water-wise gardening

Advice and design ideas  
for the 21st century  
From the editors of *Sunset*

# The Inside Story: Water Conservation at Home



**Let's  
Learn  
About...**

**The Water Cycle**

## YEAR-ROUND STAGE ONE WATER RESTRICTIONS FOR CITY OF MODESTO CUSTOMERS



### be a **WISER WATER MISER** CITY OF MODESTO

- Outdoor watering must be kept on your property... avoid water runoff.
- Outdoor water use prohibited between noon and 7 p.m. daily.**
- Odd-numbered addresses ending in 1, 3, 5, 7 or 9 water on Wednesday, Friday and Sunday.
- Even-numbered addresses ending in 2, 4, 6, 8 or 0 water on Tuesday, Thursday and Saturday.
- NO OUTDOOR WATER USE ON MONDAYS.**
- Car washing is subject to above with use of positive shut-off nozzle.
- Hosing concrete areas, building exteriors, etc. may be done with a city-issued permit and only with a positive shut-off nozzle.
- Water leaks, once identified, must be repaired within 24 hours.
- Restaurants are encouraged to serve water only upon request.

**Violations of the water use restrictions can result in penalties being added to your water/sewer bill from the City of Modesto.**

**TO REPORT WATER WASTE,  
CALL (209) 342-4580**

**FOR WATER CONSERVATION TIPS, GO TO  
[www.modestogov.com/pwd](http://www.modestogov.com/pwd)  
AND CLICK ON WATER CONSERVATION**



*Water Conservation School Presentation Materials*



Water Conservation Adult Kit





Water Conservation Kit

## Water Conservation Program



### Residential Water Use

AVERAGE OUTDOOR RESIDENTIAL USE:  
 USE % USE GAL/YR  
 Landscaping >50% >66,175

AVERAGE INDOOR RESIDENTIAL USE:  
 USE % USE GAL/YR  
 Toilets 26.7% 6,275  
 Clothes Washer 21.7% 5,475  
 Showers 16.8% 4,234  
 Faucets 15.7% 3,978  
 Leaks 13.7% 3,467  
 Other 5.8% 0,584

For more information or to report water waste, call (209) 342-4580.

# Be a WISER WATER MISER



## Water Conservation Program



### Water Schedule for City of Modesto Customers

Stage One • Year-Round

Outdoor watering must be kept on your property ... avoid water runoff.

Outdoor water use prohibited between noon and 7 p.m. daily.

Odd-numbered addresses ending in 1, 3, 5, 7 or 9 water on Wednesday, Friday and Sunday.

Even-numbered addresses ending in 2, 4, 6, 8 or 0 water on Tuesday, Thursday and Saturday.

**NO OUTDOOR WATER USE ON MONDAYS**

CITY OF MODESTO WATER CONSERVATION





City of Modesto Water Conservation Advertisement

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**Appendix B - City of Modesto Water Shortage Contingency  
Plan**

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**CITY OF MODESTO – DROUGHT CONTINGENCY PLAN - Drought Stage 1 is in Effect as of May 1, 2003**

| Drought Stage 1--Minor Shortage Potential  | Drought Stage II--Moderate Shortage Potential  | Drought Stage III--Critical Shortage Potential  |
|--|--|---|
| <p>Groundwater levels are dropping due to the increased use associated with a warm, dry season, and due to lower than average precipitation and runoff.</p> <p>Production from wells is decreasing.</p> <p>There is a possibility that customer demands and system pressure requirements cannot be met at all times.</p>   | <p align="center"><b>Phasing Criteria</b></p> <p>Groundwater levels are dropping due to the increased use associated with a warm, dry season, and due to lower than average precipitation and runoff.</p> <p>Production from wells is decreasing.</p> <p>There is a possibility that customer demands and system pressure requirements cannot be met at all times.</p>   | <p>Groundwater levels are dropping due to the increased use associated with a warm, dry season, and due to lower than average precipitation and runoff.</p> <p>Production from wells is decreasing.</p> <p>Customer demands and system pressure requirements cannot be met.</p>   |
| <p>10%-20% reduction in total water production from baseline.</p> <ul style="list-style-type: none"> <li>* Outdoor water use prohibited daily from noon - 7 p.m.*<br/>Odd-numbered addresses water W, F, Su<br/>Even-numbered addresses water, T, Th, Sa<br/>No outdoor water use on Mondays.</li> <li>* Car washing subject to above-cited limitations with use of a positive shutoff nozzle</li> <li>* Hosing concrete areas, building exteriors, etc., may only be done with a City-issued permit and only with use of a positive shutoff nozzle.</li> <li>* Water leaks, once identified, must be repaired within 24 hours.</li> <li>* Restaurants encouraged to serve water only on request.</li> <li>* New landscaping to comply with existing &amp; future landscape ordinances.</li> <li>* Water meter installation on all new single-family homes.</li> </ul> <p>*Hours of restricted outdoor use may be extended to 9 a.m. – 7 p.m. at Council discretion.</p> | <p align="center"><b>Reduction Objectives</b></p> <p>20%-35% reduction in total water production from baseline.</p> <p align="center"><b>Requested Consumer Actions</b></p> <ul style="list-style-type: none"> <li>* Outdoor water use prohibited daily from 9 a.m. – 7 p.m.<br/>Odd-numbered addresses water W, F, Su<br/>Even-numbered addresses water T, Th, Sa<br/>No outdoor water use on Mondays.<br/>No watering of front yards except for trees and shrubs by hand, and<br/>No watering of front yards except for trees and shrubs by hand, and<br/>vegetation maintained through drip irrigation. Backyard watering subject to above-cited limitations.</li> <li>* Car washing subject to above-cited limitations with use of a positive shutoff nozzle.</li> <li>* Hosing concrete areas, building exteriors, etc., is prohibited except for health/safety concerns.</li> <li>* Water leaks, once identified, must be repaired within 24 hours.</li> <li>* Restaurants prohibited from serving water except upon request.</li> <li>* New landscaping to comply with existing &amp; future landscape ordinances.</li> <li>* Mandatory retrofit of low flow showerheads in homes when building remodeling occurs.</li> <li>* No use of outdoor fountains except for maintenance purposes.</li> <li>* Water meter installation on all new single-family homes.</li> <li>* Creation of a community-based task force to deal with possible implementation of State III restrictions.</li> </ul> <p align="center"><b>Penalties* for Excessive Use</b></p> <ul style="list-style-type: none"> <li>\$150 Administrative fee assessed upon 2<sup>nd</sup> violation.</li> <li>\$250 Admin. fee assessed upon 3<sup>rd</sup> violation (includes meter installation).</li> <li>\$300 Administrative fee assessed for each subsequent violation.</li> </ul> <p>*Penalties assessed for violations occurring within 12 months of first violation.</p> | <p>35%-50% reduction in total water production from baseline.</p> <ul style="list-style-type: none"> <li>* No outdoor water use except for trees and shrubs by hand, and vegetation maintained through drip irrigation.</li> <li>* Car washing permitted at car wash facilities only.</li> <li>* Hosing concrete areas, building exteriors, etc., is prohibited except for health/safety concerns.</li> <li>* Water leaks, once identified, must be repaired within 24 hours.</li> <li>* Restaurants prohibited from serving water except upon request.</li> <li>* Mandatory retrofit of low flow showerheads and toilets in homes when building remodeling occurs.</li> <li>* No use of outdoor fountains except for maintenance purposes.</li> <li>* Moratorium on all new landscaping.</li> <li>* Building moratorium on all new water connections, including new swimming pools.</li> </ul> |
| <ul style="list-style-type: none"> <li>\$ 50 Administrative Fee assessed upon 2<sup>nd</sup> violation.</li> <li>\$200 Admin. Fee assessed upon 3<sup>rd</sup> violation (includes meter installation).</li> <li>\$250 Administrative fee assessed for each subsequent violation.</li> </ul>   | <p align="center"><b>Penalties* for Excessive Use</b></p> <ul style="list-style-type: none"> <li>\$150 Administrative fee assessed upon 2<sup>nd</sup> violation.</li> <li>\$250 Admin. fee assessed upon 3<sup>rd</sup> violation (includes meter installation).</li> <li>\$300 Administrative fee assessed for each subsequent violation.</li> </ul> <p>*Penalties assessed for violations occurring within 12 months of first violation.</p>  | <ul style="list-style-type: none"> <li>\$200 Administrative fee assessed upon 2<sup>nd</sup> violation.</li> <li>\$300 Admin. fee assessed upon 3<sup>rd</sup> violation (includes meter installation).</li> <li>\$400 Administrative fee assessed for each subsequent violation.</li> </ul>  |

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**APPENDIX K**

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UWMP Adoption Resolution

DRAFT

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UWMP Adoption Resolution will be included with final report

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WEST YOST  
  
ASSOCIATES

  
**MODESTO**  
CALIFORNIA

 **MID** Modesto  
Irrigation  
District  
Water and Power