

*City of Fresno*

# Urban Water Management Plan

August 2008

WEST YOST



ASSOCIATES

*Consulting Engineers*





# City of Fresno Final Urban Water Management Plan

Prepared for  
City of Fresno

Prepared by  
West Yost Associates

August 2008



# CITY OF FRESNO URBAN WATER MANAGEMENT PLAN

---

Prepared for

**City of Fresno**

August 2008

WEST YOST



ASSOCIATES

*Consulting Engineers*

439-02-05-01



---

Gerry S. Nakano



---

Elizabeth Drayer

## ACKNOWLEDGEMENTS

West Yost Associates wishes to express our appreciation to several City staff members who provided their assistance during the preparation of this Urban Water Management Plan.

- Brock Buche, Project Manager
- Lon Martin, Assistant Public Utilities Director - Administration
- Steve Hogg, Assistant Public Utilities Director - Wastewater
- Garth Gaddy, Assistant Public Utilities Director - Water
- Doug Kirk, Chief of Operations - Groundwater
- Robert Moorhead, Chief of Operations – Surface Water Treatment Facility
- Henry McLaughlin, Management Analyst III
- Nora Laikam, Water Conservation Supervisor

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>ES-1</b>
<b>OVERVIEW .....</b>	<b>ES-1</b>
<b>COMPLIANCE WITH THE UWMP ACT.....</b>	<b>ES-1</b>
<b>CHAPTER 1. INTRODUCTION.....</b>	<b>1-1</b>
PURPOSE .....	1-1
PLAN CONTENTS, ORGANIZATION AND FORMAT .....	1-1
GLOSSARY OF TERMS AND ACRONYMS.....	1-2
<b>CHAPTER 2. PLAN PREPARATION, COORDINATION AND ADOPTION.....</b>	<b>2-1</b>
PLAN PREPARATION.....	2-1
Public Involvement .....	2-1
Other Agency Involvement.....	2-1
Plan Adoption .....	2-2
Plan Review and Update.....	2-3
Compliance with the California Environmental Quality Act .....	2-3
Resource Maximization and Import Minimization.....	2-3
<b>CHAPTER 3. WATER SERVICE AREA.....</b>	<b>3-1</b>
WATER SERVICE AREA.....	3-1
Service Area Description .....	3-1
Service Area Population .....	3-1
Historical Water Service Area Population.....	3-1
Projected Future Water Service Area Population .....	3-2
Water Customers.....	3-3
Affordable Housing Units.....	3-3
Water Connections.....	3-5
Service Area Characteristics.....	3-7
Climate.....	3-7
Other Demographic Factors.....	3-8
EXISTING WATER SYSTEM.....	3-9
Historical Overview .....	3-9
Existing Water System.....	3-10
<b>CHAPTER 4. WATER SUPPLY .....</b>	<b>4-1</b>
EXISTING SUPPLY SOURCES .....	4-1
Existing and Future Surface Water Supplies .....	4-1
Surface Water Supplies Available through the City’s FID Contract.....	4-1
FID Water Entitlements on the Kings River.....	4-1
Percent Allocation of FID Supply to the City.....	4-2
Surface Water Available Under the City’s USBR Contract .....	4-4
Surface Water Supply Available through the City’s Wastewater Recycle Exchange .....	4-5
Summary of Existing and Future Surface Water Supplies .....	4-6

Existing and Future Groundwater Supplies .....	4-6
Groundwater Overview.....	4-6
Groundwater Management.....	4-6
Description of Groundwater Basin .....	4-8
Basin Location .....	4-8
Area Geology .....	4-8
Aquifer Characteristics .....	4-9
Current Water Level Elevation and Flow Direction .....	4-9
Historical Water Level Trends.....	4-10
Groundwater Overdraft.....	4-11
Groundwater Quality .....	4-11
Estimated Groundwater Yield for the City .....	4-12
Natural Recharge .....	4-12
Subsurface Inflow .....	4-12
Intentional Groundwater Recharge with Surface Water.....	4-12
Groundwater Pumpage.....	4-13
Current Groundwater Pumpage .....	4-13
Projected Groundwater Pumpage .....	4-14
<b>PLANNED SUPPLY PROJECTS AND PROGRAMS .....</b>	<b>4-15</b>
Expansion of Water Conservation Program .....	4-15
Expansion of Surface Water Treatment Capacity .....	4-16
Expansion of Groundwater Recharge Program .....	4-17
Development of Recycled Water for Landscape Irrigation .....	4-18
Summary of Future Water Supply Projects .....	4-19
<b>TRANSFER AND EXCHANGE OPPORTUNITIES.....</b>	<b>4-20</b>
<b>DEVELOPMENT OF DESALINATED WATER.....</b>	<b>4-21</b>
<b>WHOLESALE SUPPLIES .....</b>	<b>4-21</b>
<b>SUMMARY OF CURRENT AND PLANNED WATER SUPPLIES.....</b>	<b>4-22</b>
<b>CHAPTER 5. WATER SUPPLY RELIABILITY.....</b>	<b>5-1</b>
<b>RELIABILITY OF SURFACE WATER SUPPLIES .....</b>	<b>5-1</b>
Reliability of Surface Water Supplies from the City’s FID Contract.....	5-1
Reliability of Surface Water Supplies from the City’s USBR Contract.....	5-3
Reliability of Surface Water Available through Recycled Water Activities .....	5-4
Reliability of All Surface Water Supplies under Various Hydrologic Conditions.....	5-5
<b>RELIABILITY OF GROUNDWATER SUPPLIES .....</b>	<b>5-5</b>
<b>RELIABILITY OF RECYCLED WATER SUPPLIES .....</b>	<b>5-6</b>
<b>SUMMARY OF OVERALL WATER SUPPLY RELIABILITY .....</b>	<b>5-6</b>
<b>WATER QUALITY IMPACTS ON RELIABILITY.....</b>	<b>5-8</b>
Surface Water.....	5-8
Groundwater .....	5-8
Recycled Water .....	5-9
<b>CHAPTER 6. WATER DEMAND.....</b>	<b>6-1</b>
<b>HISTORICAL WATER PRODUCTION AND CONSUMPTION .....</b>	<b>6-1</b>
Historical Water Production Records .....	6-1

Per Capita Water Use.....	6-2
Historical Per Capita Water Use.....	6-2
Projected Future Per Capita Water Use.....	6-3
Unaccounted-For Water.....	6-4
Historical Water Consumption.....	6-4
<b>FUTURE DEMAND PROJECTIONS.....</b>	<b>6-4</b>
Per Capita Based Potable Demand Projections.....	6-4
Land Use Based Potable Demand Projections.....	6-6
Comparison of Per Capita and Land Use Based Demand Projections.....	6-6
<b>ADDITIONAL WATER CONSERVATION.....</b>	<b>6-8</b>
<b>PROJECTED URBAN WATER DEMANDS.....</b>	<b>6-8</b>
<b>SALES TO OTHER AGENCIES.....</b>	<b>6-11</b>
<b>ADDITIONAL WATER USES AND LOSSES.....</b>	<b>6-11</b>
Groundwater Recharge.....	6-11
Other Water Uses.....	6-12
Unaccounted-For System Losses.....	6-12
<b>TOTAL WATER USE.....</b>	<b>6-13</b>
<b>CHAPTER 7. COMPARISON OF SUPPLY AND DEMAND.....</b>	<b>7-1</b>
<b>WATER SERVICE RELIABILITY.....</b>	<b>7-1</b>
Normal Water Years.....	7-1
Single Dry Water Years.....	7-3
Multiple Dry Water Years.....	7-5
Multiple Dry Years Ending in 2010.....	7-5
Multiple Dry Years Ending in 2015.....	7-5
Multiple Dry Years Ending in 2020.....	7-5
Multiple Dry Years Ending in 2025.....	7-9
Multiple Dry Years Ending in 2030.....	7-9
<b>CHAPTER 8. DEMAND MANAGEMENT MEASURES.....</b>	<b>8-1</b>
<b>DEMAND MANAGEMENT MEASURES.....</b>	<b>8-1</b>
<b>OVERVIEW OF PAST AND CURRENT WATER CONSERVATION PROGRAMS AND MEASURES.....</b>	<b>8-2</b>
<b>DESCRIPTION OF DMM IMPLEMENTATION.....</b>	<b>8-3</b>
<b>DMM 1: Water Survey Programs for Single Family and Multi-Family Residential Customers.....</b>	<b>8-5</b>
Corresponding BMP.....	8-5
Description.....	8-5
Implementation Schedule.....	8-6
Annual Budget/Expenditures.....	8-6
<b>DMM 2: Residential Plumbing Retrofit.....</b>	<b>8-6</b>
Corresponding BMP.....	8-6
Description.....	8-7
Implementation Schedule.....	8-7
Annual Budget/Expenditures.....	8-7

DMM 3: System Water Audits, Leak Detection and Repair .....	8-7
Corresponding BMP .....	8-7
Description .....	8-7
Implementation Schedule.....	8-7
Annual Budget/Expenditures .....	8-8
DMM 4: Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections .....	8-8
Corresponding BMP .....	8-8
Description .....	8-8
Implementation Schedule.....	8-9
Annual Budget/Expenditures .....	8-9
DMM 5: Large Landscape Conservation Programs and Incentives .....	8-9
Corresponding BMP .....	8-9
Description .....	8-10
Implementation Schedule.....	8-10
Annual Budget/Expenditures .....	8-10
DMM 6: High-Efficiency Washing Machine Rebate Programs.....	8-11
Corresponding BMP .....	8-11
Description .....	8-11
Implementation Schedule.....	8-11
Annual Budget/Expenditures .....	8-11
DMM 7: Public Information Programs.....	8-12
Corresponding BMP .....	8-12
Description .....	8-12
Implementation Schedule.....	8-12
Annual Budget/Expenditures .....	8-12
DMM 8: School Education Programs.....	8-13
Corresponding BMP .....	8-13
Description .....	8-13
Implementation Schedule.....	8-13
Annual Budget/Expenditures .....	8-13
DMM 9: Conservation Programs for Commercial, Industrial and Institutional Accounts .....	8-13
Corresponding BMP .....	8-13
Description .....	8-13
Implementation Schedule.....	8-14
Annual Budget/Expenditures .....	8-14
DMM 10: Wholesale Agency Programs.....	8-14
Corresponding BMPs.....	8-14
Description.....	8-14
Implementation Schedule.....	8-15
Annual Budget/Expenditures .....	8-15
DMM 11: Conservation Pricing.....	8-15
Corresponding BMP .....	8-15
Description .....	8-15
Implementation Schedule.....	8-16
Annual Budget/Expenditures .....	8-17

DMM 12: Water Conservation Coordinator .....	8-18
Corresponding BMP .....	8-18
Description .....	8-18
Implementation Schedule.....	8-18
Annual Budget/Expenditures .....	8-18
DMM 13: Water Waste Prohibitions .....	8-18
Corresponding BMP .....	8-18
Description .....	8-18
Implementation Schedule.....	8-19
Annual Budget/Expenditures .....	8-19
DMM 14: Residential Ultra-Low Flush Toilet Replacement Programs.....	8-19
Corresponding BMP .....	8-19
Description .....	8-19
Implementation Schedule.....	8-19
Annual Budget/Expenditures .....	8-20
DETERMINATION OF DMM IMPLEMENTATION.....	8-20
EVALUATION OF DMMS NOT CURRENTLY IMPLEMENTED .....	8-20
DMM 3 (System Water Audits, Leak Detection and Repair).....	8-21
DMM 4 (Metering With Commodity Rates for All New Connections and Retrofit of Existing Connections) and DMM 11 (Conservation Pricing).....	8-21
DMM 9 (Conservation Programs for Commercial, Industrial, and Institutional Accounts) .....	8-21
POTENTIAL FUTURE DEMAND MANAGEMENT MEASURES .....	8-22
<b>CHAPTER 9. WATER SHORTAGE CONTINGENCY PLAN.....</b>	<b>9-1</b>
PLAN DEVELOPMENT.....	9-1
Previous Planning Efforts .....	9-1
Drought Contingency Plan.....	9-1
1994 Water Shortage Contingency Plan .....	9-2
Current Planning Effort.....	9-2
STAGES OF ACTION FOR WATER USE REDUCTION.....	9-2
Water Use Reduction Plan .....	9-2
Water Use Reduction Plan Triggers .....	9-3
ESTIMATED MINIMUM WATER SUPPLY FOR NEXT THREE YEARS .....	9-5
PLANNING FOR CATASTROPHIC WATER SUPPLY INTERRUPTION .....	9-7
Loss of Surface Water Supply .....	9-8
Loss of Groundwater Supply .....	9-8
Area-Wide Electrical Power Failure .....	9-8
Earthquake .....	9-9
Flood .....	9-10
WATER USE PRIORITIES DURING WATER SHORTAGE EMERGENCIES .....	9-11
MANDATORY PROHIBITIONS AND RESTRICTIONS .....	9-11
CONSUMPTION REDUCTION METHODS .....	9-14
Per Capita Health and Safety Allotments Used in 1994 Plan.....	9-14
Estimated Residential Wintertime Water Use .....	9-14

Non-Residential Water Use Allotments..... 9-15  
 Implementation of Residential and Non-Residential Water Use Allotments ..... 9-16  
**PENALTIES AND CHARGES** ..... 9-17  
 Excessive Water Use..... 9-17  
 Violation of City Municipal Code Section 6-520 Wastage of Water ..... 9-18  
**REVENUE AND EXPENDITURE ANALYSIS** ..... 9-19  
 Potential Revenue Impacts..... 9-19  
 Potential Expenditure Impacts ..... 9-21  
 Proposed Measures to Overcome Revenue and Expenditure Impacts..... 9-22  
**DRAFT WATER SHORTAGE CONTINGENCY RESOLUTION** ..... 9-26  
**MECHANISMS FOR DETERMINING ACTUAL WATER USE REDUCTIONS** ..... 9-26  
**CHAPTER 10. RECYCLED WATER** ..... **10-1**  
**PARTICIPATING AGENCIES**..... 10-1  
**EXISTING WASTEWATER COLLECTION AND TREATMENT SYSTEMS AND RECYCLED WATER USE**..... 10-1  
 Wastewater Collection and Treatment Systems ..... 10-1  
 Existing Wastewater Collection Systems ..... 10-1  
 Existing Wastewater Treatment Systems..... 10-2  
 Regional Wastewater Reclamation Facility..... 10-2  
 North Fresno Wastewater Reclamation Facilities (WRF) Satellite Plant..... 10-3  
 Current Recycled Water Use ..... 10-5  
**POTENTIAL AND PROJECTED RECYCLED WATER USE**..... 10-6  
**METHODS TO ENCOURAGE RECYCLED WATER USE** ..... 10-9  
**OPTIMIZING THE USE OF RECYCLED WATER** ..... 10-10

- APPENDIX A1: Urban Water Management Planning Act**
- APPENDIX A2: Additional Urban Water Management Planning Act Provisions**
- APPENDIX B1: Urban Water Management Plan Notifications**
- APPENDIX B2: Fresno Bee Proof of Publication**
- APPENDIX C: Urban Water Management Plan Resolution**
- APPENDIX D1: USBR Contract**
- APPENDIX D2: USBR Contract Amendment**
- APPENDIX D3: FID Contract**
- APPENDIX E: Fresno Area Regional Groundwater Management Plan**
- APPENDIX F: Municipal Code Provisions**
- APPENDIX G: Annual Water Conservation Program Status Report**
- APPENDIX H: Water Conservation Plan BMPs**
- APPENDIX I: Water Meter Plan Schedule**
- APPENDIX J: Draft WSCP Resolution**

## LIST OF TABLES

Table ES-1. DWR Guidebook Table Cross-References .....	ES-2
Table 2-1. Coordination with Other Agencies (DWR Table 1).....	2-2
Table 3-1. City of Fresno Water Service Area Population (2001-2008) .....	3-2
Table 3-2. City of Fresno Water Service Area Population Projections (DWR Table 2) .....	3-3
Table 3-3. 2002 City of Fresno Lower Income Households.....	3-4
Table 3-4. City of Fresno 2007 Water Service Connections .....	3-6
Table 3-5. City of Fresno Future Projected Water Service Connections.....	3-7
Table 3-6. Climate Data (DWR Table 3).....	3-8
Table 4-1. FID Kings River Water Supply Applicable to the City’s Agreements .....	4-3
Table 4-2. Projected Allocation of FID Kings River Diversion to the City of Fresno .....	4-4
Table 4-3. FID Kings River Diversions Available to the City of Fresno during Normal Years .....	4-4
Table 4-4. USBR Entitlement Available to the City during Normal Years.....	4-5
Table 4-5. Recharge Water Available to the City during Normal Years.....	4-5
Table 4-6. Existing and Future Surface Water Supplies during Normal Years.....	4-6
Table 4-7. Groundwater Management Plan Participants .....	4-7
Table 4-8. Summary of Groundwater Pump Tests within the City of Fresno .....	4-9
Table 4-9. Current Groundwater Pumping Rights (DWR Table 5).....	4-13
Table 4-10. Amount of Groundwater Pumped by City of Fresno (DWR Table 6) .....	4-14
Table 4-11. Amount of Groundwater Projected to be Pumped by City of Fresno (DWR Table 7) .....	4-14
Table 4-12. Projected Future Surface Water Treatment Capacity .....	4-17
Table 4-13. Projected Future Groundwater Recharge .....	4-18
Table 4-14. Projected Future Recycled Water Use for Landscape Irrigation Purposes .....	4-19
Table 4-15. Future Water Supply Projects (DWR Table 17).....	4-20
Table 4-16. Transfer and Exchange Opportunities (DWR Table 11).....	4-21
Table 4-17. Opportunities for Desalinated Water (DWR Table 18).....	4-21
Table 4-18. Current and Planned Water Supplies (DWR Table 4).....	4-22
Table 5-1. Available FID Diversion Quantity Based on the 2006 Settlement Agreement.....	5-2
Table 5-2. FID Kings River Diversions Available to the City .....	5-3
Table 5-3. Available USBR Entitlement Adopted from the 2006 Settlement Agreement .....	5-3

Table 5-4. USBR Entitlement Available to the City for Each Hydrologic Year Type.....	5-4
Table 5-5. Surface Water Supply Available to the City Under All Hydrologic Conditions .....	5-5
Table 5-6. Overall Supply Reliability (DWR Table 8).....	5-6
Table 5-7. Basis of Water Year Data (DWR Table 9).....	5-7
Table 5-8. Factors Resulting in Inconsistency of Supply (DWR Table 10) .....	5-8
Table 5-9. Current and Projected Water Supply Changes Due to Water Quality (DWR Table 39) .....	5-9
Table 6-1. Historical Water Production .....	6-2
Table 6-2. Reduction in Per Capita Water Demand as a Result of Additional Water Conservation .....	6-3
Table 6-3. Historical Water Use by Class, acre-feet.....	6-5
Table 6-4. Land Use Based Demand Projections by Customer Class (with recent conservation and future metering).....	6-7
Table 6-5. Projected Urban Water Demands through the Year 2030.....	6-9
Table 6-6. Past, Current, and Projected Water Deliveries (DWR Table 12).....	6-10
Table 6-7. Water Sales to Other Agencies (DWR Table 13).....	6-11
Table 6-8. Additional Water Uses and Losses (DWR Table 14).....	6-12
Table 6-9. Total Water Use (DWR Table 15).....	6-13
Table 7-1. Projected Normal Water Year Supply (DWR Table 40).....	7-2
Table 7-2. Projected Normal Water Year Demand (DWR Table 41).....	7-2
Table 7-3. Projected Normal Water Year Supply and Demand Comparison (DWR Table 42) .....	7-2
Table 7-4. Projected Single Dry Year Water Supply (DWR Table 43).....	7-4
Table 7-5. Projected Single Dry Year Water Demand (DWR Table 44) .....	7-4
Table 7-6. Projected Single Dry Year Supply and Demand Comparison (DWR Table 45) .....	7-4
Table 7-7. Projected Supply During Multiple Dry Year Period Ending in 2010 (DWR Table 46) .....	7-6
Table 7-8. Projected Demand During Multiple Dry Year Period Ending in 2010 (DWR Table 47) .....	7-6
Table 7-9. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2010 (DWR Table 48).....	7-6
Table 7-10. Projected Supply During Multiple Dry Year Period Ending in 2015 (DWR Table 49) .....	7-7
Table 7-11. Projected Demand During Multiple Dry Year Period Ending in 2015 (DWR Table 50) .....	7-7

Table 7-12. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2015 (DWR Table 51).....	7-7
Table 7-13. Projected Supply During Multiple Dry Year Period Ending in 2020 (DWR Table 52) .....	7-8
Table 7-14. Projected Demand During Multiple Dry Year Period Ending in 2020 (DWR Table 53) .....	7-8
Table 7-15. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2020 (DWR Table 54).....	7-8
Table 7-16. Projected Supply During Multiple Dry Year Period Ending in 2025 (DWR Table 55) .....	7-10
Table 7-17. Projected Demand During Multiple Dry Year Period Ending in 2025 (DWR Table 56) .....	7-10
Table 7-18. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2025 (DWR Table 57).....	7-10
Table 7-19. Projected Supply During Multiple Dry Year Period Ending in 2030 (DWR Table 58) .....	7-11
Table 7-20. Projected Demand During Multiple Dry Year Period Ending in 2030 (DWR Table 59) .....	7-11
Table 7-21. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2030 (DWR Table 60).....	7-11
Table 8-1. Overview of City’s Current Water Conservation Activities .....	8-4
Table 8-2. Summary of City Water Accounts in Fiscal Year 2007 .....	8-8
Table 8-3. City of Fresno Water Rates for Unmetered Services (Single-Family Residential Only).....	8-15
Table 8-4. City of Fresno Water Rates for Metered Services.....	8-16
Table 8-5. City of Fresno Wastewater Rate Structure by Customer Type .....	8-17
Table 8-6. Non-Implemented Demand Management Measures (DWR Table 16).....	8-21
Table 8-7. Potential Future Water Conservation Measures .....	8-22
Table 9-1. City of Fresno Water Supply Shortage Stages and Conditions (DWR Table 23) .....	9-3
Table 9-2. Water Use Reduction Plan Triggering Mechanisms .....	9-4
Table 9-3. Estimated Minimum Water Supply for the Next Three Years (DWR Table 24).....	9-6
Table 9-4. Potential Emergency Events and Summary of Possible Actions (DWR Table 25) .....	9-7
Table 9-5. Mandatory Prohibitions and Water Use Restrictions for City of Fresno Water Shortage Contingency Plan (DWR Table 26).....	9-13
Table 9-6. Estimated Residential Wintertime Water Use.....	9-15

Table 9-7. Residential Water Use Allotments For Stage 3 and 4 Water Shortages..... 9-15

Table 9-8. Proposed Non-Residential Water Use Allotments for Stage 3 and 4 Water Shortages..... 9-16

Table 9-9. Stage 3 and 4 Water Use Allotments and Resulting Water Use Reductions (DWR Table 27) ..... 9-17

Table 9-10. Penalties and Charges (DWR Table 28)..... 9-20

Table 9-11. Potential Water Revenue Impacts During a Water Shortage ..... 9-21

Table 9-12. Revenue and Expenditure Analysis WITHOUT Rate Increases ..... 9-23

Table 9-13. Proposed Measures to Overcome Revenue and Expenditures Impacts (DWR Tables 29 and 30) ..... 9-24

Table 9-14. Revenue and Expenditure Analysis WITH Rate Increases ..... 9-25

Table 9-15. Water Production Monitoring Reporting Schedule ..... 9-27

Table 9-16. Water Use Monitoring Mechanisms (DWR Table 31)..... 9-27

Table 10-1. Agencies Participating in Recycled Water Activities (DWR Table 32) ..... 10-1

Table 10-2. Wastewater Collected and Treated (DWR Table 33)..... 10-4

Table 10-3. Disposal of Wastewater (Non-Recycled) (DWR Table 34)..... 10-4

Table 10-4. Current (2005) Recycled Water Uses (DWR Table 35a)..... 10-5

Table 10-5. Recycled Water Uses—2000 Projection Compared with 2005 Actual (DWR Table 37) ..... 10-6

Table 10-6. Potential Recycled Water Uses (DWR Table 35b) ..... 10-7

Table 10-7. Projected Recycled Water Uses (DWR Table 36) ..... 10-8

Table 10-8. Methods to Encourage Recycled Water Use (DWR Table 38)..... 10-9

## LIST OF FIGURES

Figure 3-1. Existing and Future Study Area .....	3-11
Figure 3-2. City of Fresno Water Service Area Estimated Historical Population .....	3-12
Figure 3-3. Projected Population Served by the City .....	3-13
Figure 3-4. Existing Water Distribution System.....	3-14
Figure 4-1. Kings Groundwater Subbasin .....	4-23
Figure 4-2. Idealized East-West Cross-Section .....	4-24
Figure 4-3. Groundwater Elevation Hydrographs for Selected City of Fresno Wells.....	4-25
Figure 4-4. Spring 2006 Groundwater Elevations in the Upper Aquifer Zone .....	4-26
Figure 4-5. Spring 2006 Groundwater Elevations in the Lower Aquifer Zone .....	4-27
Figure 4-6. Projected Normal Year Annual Water Supply and Demand (2006 to 2030).....	4-28
Figure 5-1. FID Kings River Water Applicable to City’s Agreement.....	5-10
Figure 5-2. Bureau Deliveries to the City of Fresno Adopted from the 2006 Settlement Agreement.....	5-11
Figure 6-1. City of Fresno Historical Per Capita Water Production and Consumption .....	6-14
Figure 6-2. Projected Future Per Capita Water Use .....	6-15
Figure 6-3. Per Capita Based Demand Projections.....	6-16
Figure 6-4. Land Use Based Demand Projections .....	6-17
Figure 6-5. Comparison of Per Capita and Land Use Based on Demand Projections.....	6-18
Figure 6-6. Projected Water Demand to 2030 .....	6-19
Figure 7-1. Projected Normal Year Annual Water Supply and Demand (2006-2030) .....	7-12
Figure 7-2. Projected Normal Water Year Supply and Demand .....	7-13
Figure 7-3. Projected Single Dry Year Water Supply and Demand .....	7-14
Figure 7-4. Projected Multiple Dry Year Water Supply and Demand .....	7-15
Figure 8-1. 1917 Fresno Water Company Letter .....	8-23
Figure 8-2. Historical per Capita Water Use .....	8-24

# EXECUTIVE SUMMARY

## OVERVIEW

This 2008 Urban Water Management Plan (UWMP) has been prepared for the City of Fresno by West Yost Associates (WYA) in accordance with the requirements of the California Urban Water Management Planning Act. This 2008 UWMP addresses current and projected future water supply availability and reliability and provides a comparison with current and projected future water demands through the year 2030. This 2008 UWMP also describes the City's current and planned water conservation programs, and provides a water shortage contingency plan for implementation in the event of a severe water shortage or water supply emergency.

This 2008 UWMP includes a future water supply plan for the City which includes a diversified portfolio of water supplies (including treated surface water, groundwater, and recycled water) and an aggressive water conservation plan to reduce water demands throughout the City's water service area. The water conservation plan takes an incremental, but realistic, approach to an aggressive long-term goal, reducing the per capita water consumption by 20 percent and balancing aquifer usage. However, the Fresno City Council has expressed their desire to raise expectations for water conservation for City-owned properties and operations. This self-imposed objective is to be considered an example to the community and citizens that the City of Fresno is making water resource management a priority. The City will also strive to go above and beyond the conservation programs proposed in this 2008 UWMP..

It should also be noted that the City's water supply plan and water conservation plan, presented herein, is consistent with Governor Arnold Schwarzenegger's February 2008 call for reducing per capita water use statewide by 20 percent by 2020.

Information and data presented in this 2008 reflects the information and data available at the time of preparation and generally reflects available water supply production and demand data through December 2007. Water supply and demand projections are provided in five-year increments to the year 2030 to provide for a 20+ year planning horizon.

This 2008 UWMP was adopted by the Fresno City Council on August 19, 2008, and supersedes all previous UWMPs prepared by the City.

## COMPLIANCE WITH THE UWMP ACT

This 2008 UWMP has been prepared in accordance with the requirements of the California Urban Water Management Planning Act, first established in 1983 and amended numerous times since then, with guidance from the California Department of Water Resources *Guidebook for Preparation of a 2005 Urban Water Management Plan* (DWR Guidebook) dated January 2005. The DWR Guidebook provides detailed information and suggestions to comply with the UWMP Act requirements. Table ES-1 provides a cross-reference between the DWR-suggested tables and the tables provided in this UWMP. The chapters and sections of this UWMP also contain references to the provisions of the UWMP Act in *italics* to demonstrate compliance with the UWMP Act.

**Table ES-1. DWR Guidebook Table Cross-References**

Table Title	DWR Table Number <sup>(a)</sup>	City of Fresno UWMP Table Number
Coordination with Appropriate Agencies	Table 1	Table 2-1
Population – Current and Projected	Table 2	Table 3-2
Climate	Table 3	Table 3-6
Current and Planned Water Supplies	Table 4	Table 4-18
Groundwater Pumping Rights	Table 5	Table 4-9
Amount of Groundwater Pumped	Table 6	Table 4-10
Amount of Groundwater Projected to be Pumped	Table 7	Table 4-11
Supply Reliability	Table 8	Table 5-6
Basis of Water Year Data	Table 9	Table 5-7
Describe the factors resulting in inconsistency of supply	Table 10	Table 5-8
Transfer and Exchange Opportunities	Table 11	Table 4-16
Past, Current and Projected Water Deliveries	Table 12	Table 6-6
Sales to Other Agencies	Table 13	Table 6-7
Additional Water Uses and Losses	Table 14	Table 6-8
Total Water Use	Table 15	Table 6-9
Evaluation of Unit Cost of Water that would result from Non-Implemented DMMs and Planned Water Supply Projects and Programs	Table 16	Table 8-6
Future Water Supply Projects	Table 17	Table 4-15
Opportunities for Desalinated Water	Table 18	Table 4-17
Agency Demand Projections Provided to Wholesale Provider	Table 19	Not Applicable
Wholesaler Identified and Quantified the Existing and Planned Sources of Water Available to Your Agency	Table 20	Not Applicable
Wholesale Supply Reliability	Table 21	Not Applicable
Factors Resulting in Inconsistency of Wholesaler’s Supply	Table 22	Not Applicable
Water Supply Shortage Stages and Conditions	Table 23	Table 9-1
Three-Year Estimated Minimum Water Supply	Table 24	Table 9-3
Preparation Actions for a Catastrophe	Table 25	Table 9-4
Mandatory Prohibitions	Table 26	Table 9-5
Consumption Reduction Methods	Table 27	Table 9-9
Penalties and Charges	Table 28	Table 9-10
Proposed Measures to Overcome Revenue Impacts	Table 29	Table 9-13
Proposed Measures to Overcome Expenditure Impacts	Table 30	Table 9-13
Water Use Monitoring Mechanisms	Table 31	Table 9-16
Recycled Water Plan Participating Agencies	Table 32	Table 10-1

Table Title	DWR Table Number <sup>(a)</sup>	City of Fresno UWMP Table Number
Wastewater Collected and Treated	Table 33	Table 10-2
Disposal of Wastewater	Table 34	Table 10-3
Recycled Water Uses – Actual	Table 35a	Table 10-4
Recycled Water Uses – Potential	Table 35b	Table 10-6
Projected Future Use of Recycled Water in Service Area	Table 36	Table 10-7
Recycled Water Uses – 2000 Projection Compared with 2005 Actual	Table 37	Table 10-5
Methods to Encourage Recycled Water Use	Table 38	Table 10-8
Current and Projected Water Supply Changes Due to Water Quality	Table 39	Table 5-9
Projected Normal Water Year Supply	Table 40	Table 7-1
Projected Normal Water Year Demand	Table 41	Table 7-2
Projected Normal Water Year Supply and Demand Comparison	Table 42	Table 7-3
Projected Single Dry Year Water Supply	Table 43	Table 7-4
Projected Single Dry Year Water Demand	Table 44	Table 7-5
Projected Single Dry Year Supply and Demand Comparison	Table 45	Table 7-6
Projected Supply During Multiple Dry Year Period Ending in 2010	Table 46	Table 7-7
Projected Demand During Multiple Dry Year Period Ending in 2010	Table 47	Table 7-8
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2010	Table 48	Table 7-9
Projected Supply During Multiple Dry Year Period Ending in 2015	Table 49	Table 7-10
Projected Demand During Multiple Dry Year Period Ending in 2015	Table 50	Table 7-11
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2015	Table 51	Table 7-12
Projected Supply During Multiple Dry Year Period Ending in 2020	Table 52	Table 7-13
Projected Demand During Multiple Dry Year Period Ending in 2020	Table 53	Table 7-14
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2020	Table 54	Table 7-15
Projected Supply During Multiple Dry Year Period Ending in 2025	Table 55	Table 7-16
Projected Demand During Multiple Dry Year Period Ending in 2025	Table 56	Table 7-17
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2025	Table 57	Table 7-18
Projected Supply During Multiple Dry Year Period Ending in 2030	Optional	Table 7-19
Projected Demand During Multiple Dry Year Period Ending in 2030	Optional	Table 7-20
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2030	Optional	Table 7-21

(a) DWR Guidebook for Preparation of a 2005 Urban Water Management Plan, January 2005.

# CHAPTER 1. INTRODUCTION

## PURPOSE

*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).*

*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.*

In accordance with Urban Water Management Planning Act, as included in the California Water Code, Division 6, Part 2.6, every urban water supplier in California 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, is required to prepare and adopt an Urban Water Management Plan (UWMP). The adopted UWMP must then be updated at least once every five years on or before December 31, in years ending in five and zero. An urban water supplier that does not prepare, adopt and submit its UWMP to the California Department of Water Resources (DWR) is ineligible to receive certain grant funding or receive drought assistance from the state.

The City of Fresno (City) is a water retailer. In 2007, the City supplied 165,798 acre-feet (af)<sup>1</sup> of potable water to 130,167 water services<sup>2</sup> in the City of Fresno water service area, and is therefore subject to the requirements of the Urban Water Management Planning Act (UWMP Act).

## PLAN CONTENTS, ORGANIZATION AND FORMAT

The UWMP Act, established in 1983 by Assembly Bill 797 and amended numerous times since then (most recently in 2005 by Senate Bill 1087), establishes the requirements for a UWMP. The latest version of the UWMP Act is provided in Appendix A. This 2008 UWMP for the City has been prepared in accordance with those requirements and contains information which is necessary to plan for the efficient use of urban water supplies within the City's water service area. This information is contained in the following chapters:

- Chapter 1: Introduction
- Chapter 2: Plan Preparation, Coordination and Adoption
- Chapter 3: Water Service Area
- Chapter 4: Water Supply
- Chapter 5: Water Supply Reliability
- Chapter 6: Water Demand
- Chapter 7: Comparison of Supply and Demand

---

<sup>1</sup> Source: City of Fresno Production Statistics (prdstats.xls), water supply shown is for 2007 calendar year.

<sup>2</sup> Source: City of Fresno Public Water System Statistics Report for Calendar Year 2007.

- Chapter 8: Demand Management Measures
- Chapter 9: Water Shortage Contingency Plan
- Chapter 10: Recycled Water

Appendices to this UWMP include the following additional information:

- Appendix A: UWMP Act
- Appendix B: Agency and Public Notices Regarding UWMP Preparation and Adoption
- Appendix C: Resolution to adopt this updated UWMP
- Appendix D: USBR and FID water supply contracts and agreements
- Appendix E: Fresno Area Regional Groundwater Management Plan
- Appendix F: City Municipal Code Water Regulations and Provisions
- Appendix G: Annual Conservation Program Status Report
- Appendix H: Excerpts from City Water Conservation Plan
- Appendix I: Residential Water Meter Plan
- Appendix J: Draft Resolution for the Implementation of the Water Shortage Contingency Plan

To demonstrate compliance with applicable water codes, applicable water code provisions are shown in italics at the beginning of each chapter or section. Furthermore, to demonstrate completeness and assist DWR in their review of this 2008 UWMP, where applicable, tables in this 2008 UWMP include corresponding DWR table numbers from DWR's Guidebook for Preparation of a 2005 Urban Water Management Plan (see Table ES-1 in the Executive Summary showing table cross-references).

## **GLOSSARY OF TERMS AND ACRONYMS**

The following terms and acronyms have been used throughout this UWMP to improve document clarity and readability.

ADAF	Average day annual flow
ADWF	Average dry weather flow
Af	Acre-feet
afa, af/yr	Acre-feet per year
Bakman	Bakman Water Company
BMPs	Best Management Practices
BOD	Biological Oxygen Demand
Bureau	United States Bureau of Reclamation

CEQA	California Environmental Quality Act
Cfs	Cubic feet per second
CI	Commercial and industrial
CII	Commercial, industrial and institutional
CIMIS	California Irrigation Management Information System
City	City of Fresno
CSUF	California State University, Fresno
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVWAC	Central Valley Water Awareness Committee
DMMs	Demand Management Measures; fourteen water conservation measures included in the UWMP Act
DOF	State of California Department of Finance
DWR	State of California Department of Water Resources
Et <sub>o</sub>	Evapotranspiration
FARGMP	Fresno Area Regional Groundwater Management Plan
FID	Fresno Irrigation District
FY	Fiscal year
FYP	Flex Your Power
GIS	Geographic Information System
Gpcd	Gallons per capita per day
Gpd	Gallons per day
GWMP	Groundwater Management Plan
HCF	Hundred cubic feet
Herndon	Herndon Water Company
KRWA	Kings River Water Association
MEF	Modified Energy Factor
MG	Million gallons
Mgd	Million gallons per day
Mg/L	Milligrams per liter
MOU	Memorandum of Understanding
NRDC	National Resources Defense Council
OES	Office of Emergency Services
Park Van Ness	Park Van Ness Mutual Water Company
PG&E	Pacific Gas and Electric Company
Pinedale	Pinedale County Water District
RWQCB	Regional Water Quality Control Board

RWRF	Regional Wastewater Reclamation Facility
SOI	Sphere of Influence
SWTF	Surface Water Treatment Facility
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UAFW	Unaccounted-for Water
ULFT	Ultra Low Flush Toilet
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act; enacted in 1983; establishes requirements for a UWMP
WF	Water Factor
WMP	Water Master Plan
WRCC	Western Regional Climate Center
WRF	Wastewater Reclamation Facility
WRIME	Water Resources & Information Management Engineering, Inc.; preparer of regional groundwater model (see Chapter 4)
WYA	West Yost Associates; preparer of this UWMP

## CHAPTER 2. PLAN PREPARATION, COORDINATION AND ADOPTION

### PLAN PREPARATION

*10620 (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3.*

*10620 (e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.*

In March 2006, as part of the City of Fresno Metropolitan Water Resources Management Plan Update (Metro Plan Update), the City of Fresno (City) authorized West Yost Associates (WYA) to prepare the City's updated 2008 UWMP. The information contained herein is based on data obtained from City staff, data included in available water supply planning documents, and review and update of data contained in the City's previous UWMPs. The City's first UWMP was prepared in 1986; the City's UWMP was then updated in 1993.

As discussed in Chapter 4, this 2008 UWMP is also consistent with the City's future water supply plan recommended in the City's on-going Metro Plan Update.

### Public Involvement

*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.*

It is the City's policy to encourage public participation when adopting plans such as the 2008 UWMP. Therefore, the City sought public input while developing this 2008 UWMP. The Draft 2008 UWMP was available for public review prior to the scheduled Public Hearing, which was held on July 22, 2008. During this review period, the Draft 2008 UWMP was available at the City's offices during normal business hours, distributed to interested parties (see below), and made available at the Fresno County Public Library. Notices for the Public Hearing were placed in the Fresno Bee newspaper. Copies of the public notices are provided in Appendix B of this 2008 UWMP.

### Other Agency Involvement

*10620 (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.*

*10621 (b) Every urban water supplier required to prepare a plan pursuant to this part shall 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.*

The City regularly coordinates with Fresno County, the Fresno Irrigation District (FID) and other water purveyors in the Fresno area, including the Bakman Water District, Pinedale Water District, Herndon Water Company, and others. The City notified the County, FID and the other local water purveyors regarding the preparation of this 2008 UWMP and distributed copies of the Draft 2008 UWMP for their review and comment. Copies of the agency notices are provided in Appendix B of this 2008 UWMP. Applicable comments were then incorporated into the final adopted 2008 UWMP. Following plan adoption, a copy of this 2008 UWMP was provided to Fresno County in accordance with the requirements of the UWMP Act. Table 2-1 provides a summary of coordination with these other agencies.

**Table 2-1. Coordination with Other Agencies (DWR Table 1)**

Agency	Was Notified about UWMP Preparation	Was Sent Copy of Draft UWMP	Commented on the Draft UWMP	Attended Public Meetings
Bakman Water Company	✓	✓		
City of Clovis	✓	✓		
Fresno County	✓	✓		
Fresno Irrigation District (FID)	✓	✓	✓	✓
Fresno Metropolitan Flood Control District (FMFCD)	✓	✓		
Friant Water Authority	✓	✓		
Garfield Irrigation District	✓	✓		
Herndon Water Company	✓	✓		
Malaga County Water District	✓	✓		
Pinedale County Water District	✓	✓		

**Plan Adoption**

*10642. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

Following the public hearing held on July 22, 2008, the Fresno City Council adopted this 2008 UWMP on August 19, 2008 (see City Resolution in Appendix C).

The City will submit the adopted 2008 UWMP to the Department of Water Resources (DWR), the California State Library, and Fresno County within 30 days after its adoption, as required by Section 10644 of the UWMP Act. The City will also make the adopted plan available for public review by maintaining a copy at the City’s Public Utilities Department Water Division office (located at 1910 East University Avenue) and posting a copy on the City Water Division’s webpage at [www.fresnowater.org](http://www.fresnowater.org).

## Plan Review and Update

*10640. The supplier shall .... 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.*

*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.*

*10621 (c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3.*

The City will periodically review the adopted 2008 UWMP to determine if any revisions or updates are warranted. Amendments or changes to the UWMP will be adopted pursuant to the requirements of the UWMP Act. Copies of amendments or changes to the UWMP will be submitted to the DWR, the California State Library, and Fresno County within 30 days after adoption.

Per the UWMP Act, the next required update of the City's UWMP will be due by December 31, 2010.

## Compliance with the California Environmental Quality Act

*10652. The California Environmental Quality Act 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 or wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.*

Per Section 10652 of the California Water Code, the California Environmental Quality Act (CEQA) does not apply to the preparation and adoption of UWMPs or the implementation of potential actions included in the Water Shortage Contingency Plan (per Section 10632 of the California Water Code) (see Chapter 9).

However, in compliance with CEQA requirements, as part of the Metro Plan Update, the City will be preparing an Environmental Impact Report for the proposed future water supply discussed in this UWMP.

## Resource Maximization and Import Minimization

*10620 (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.*

Water management tools have been used by the City to help maximize water resources and reduce the need for new supplies. The City has been committed to integrating water conservation into future supply and demand solutions for many years. In 1957, the City was one of the first in the State of California to pass a water waste ordinance and, in 1978, the City implemented time-of-day outdoor water use restrictions to help optimize water use. Today, the City continues to implement numerous water conservation programs, including an aggressive public information program and school education program. In 2006, the City implemented a residential toilet retrofit program which has been extremely successful, and in late 2007, the City implemented a high-efficiency clothes washer rebate program. The City's future water conservation plan, described in this 2008 UWMP, takes an incremental, but realistic, approach to an aggressive long-term goal, reducing the per capita water consumption by 20 percent and balancing aquifer usage.

However, the Fresno City Council has expressed their desire to raise expectations for water conservation for City-owned properties and operations. This self-imposed objective is to be considered an example to the community and citizens that the City of Fresno is making water resource management a priority. The City will also strive to go above and beyond the water conservation programs proposed in this 2008 UWMP and expedite the construction of new facilities and the implementation of new programs to ensure that the use of available water resources is maximized in the future.

A full discussion of the City's water conservation and demand reduction efforts is included in Chapter 8 of this 2008 UWMP.

By reducing the demand of current water customers and assuring that all new water uses are efficient, the amount of water the City will need to serve existing and future customers and the need for new supplies has been reduced. The City is also implementing a residential water meter program which will install and meter water service for all single-family residential customers in the City by 2013. A complete discussion of the residential water meter program is provided in Chapter 8; the schedule for the program is provided in Appendix I. When this program is completed, and all of the City's water customers are metered, the City and their customers will be able to work together to optimize future water use.

# CHAPTER 3. WATER SERVICE AREA

## WATER SERVICE AREA

*10631 (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 project 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.*

### Service Area Description

The City currently encompasses over 110 square miles and the City Water Division serves an estimated service area population of 502,657 people (as of January 1, 2008). With the exception of the Bakman Water Company (Bakman), Pinedale County Water District (Pinedale), Herndon Water Company (Herndon)<sup>1</sup>, Park Van Ness Mutual Water Company (Park Van Ness), California State University at Fresno (CSUF), and private groundwater users located within county islands, the City serves the entire area encompassed by its City Limits and Sphere of Influence (SOI). The SOI is coincident with the General Plan Boundary and therefore, includes all lands planned to be annexed by the City by 2025. Figure 3-1 shows the City's water service area. Future growth includes the area known as the Southeast Growth Area, and expansion of the City limits along the western and southern boundaries to the SOI.

### Service Area Population

Historical and projected population was developed using data collected from the City and the California Department of Finance (DOF). The actual methodology used to develop existing and future population estimates is described in more detail below.

#### Historical Water Service Area Population

The City of Fresno (City) was founded in 1885 in the heart of the nation's richest agricultural county and has historically been one of the fastest growing cities in the United States, with the population increasing from 10,818 persons in 1900 to 60,685 in 1940, and 218,202 in 1980 (Census data)<sup>2</sup>. According to the U.S. Census, the City population was 354,282 in 1990, and 427,652 in 2000<sup>3</sup>.

In the 1986 City of Fresno Urban Water Management Plan (UWMP), it was estimated that the population served by the City Water Division was 269,824; 15,176 less than the City population of 285,000<sup>4</sup>, which accounted for areas within the City Limits which were served by private water

---

<sup>1</sup> It should be noted that the City is considering acquiring the Herndon Water Company and incorporating it into the City's water service area in the near future.

<sup>2</sup> City of Fresno Urban Water Management Plan 1986-1995, page 28,

<sup>3</sup> U.S. Census website ([www.factfinder.census.gov](http://www.factfinder.census.gov)), 1990 and 2000 Census data for the City of Fresno.

<sup>4</sup> City of Fresno Urban Water Management Plan 1986-1995, page 29 footnote.

companies, special districts, or their own wells. In 1989, the City Water Division acquired numerous County water facilities and began serving customers previously served by the County. This added a significant number of customers to the City’s water service area; however, the exact number of customers added is unknown.

In 2000, the City Water Division developed a methodology for calculating the population of the City’s water service area. The methodology involved summing all of the Census tract data for the April 2000 Census for the City’s overall service area, and subtracting out tracts not served by the City. These tracts included areas served by Bakman, Pinedale, Herndon, Park Van Ness, and the City of Clovis, as well as areas outside the City service area, unserved areas within County areas, unserved areas within City areas and areas with only partial service (i.e., straddling City service areas). This population was then adjusted based on a 1.9 percent annual growth rate (based on the Fresno County Council of Government’s (COG) growth rate for the City of Fresno from 1990 to 2000<sup>5</sup>) to determine the January 2001 water service area population.

For subsequent years, the City Water Division has used an annual population increase of 1.9 percent, based on the COG annual growth rate, to account for growth within the water service area. The estimated population for the City water service area for the last eight years is shown in Table 3-1.

**Table 3-1. City of Fresno Water Service Area Population (2001-2008)<sup>(a)</sup>**

	2001	2002	2003	2004	2005	2006	2007	2008
Historical Service Area Population	440,608	448,980	457,511	466,203	475,061	484,087	493,285	502,657

<sup>(a)</sup> Populations are for January 1 of the year shown. As estimated by the City Water Division (“census pop.xls”).

WYA estimated the water service area population from 1989 to 2000 by using the DOF population estimates for the City of Fresno, adjusted to account for additional population served by the City as a result of the acquisition of County facilities in 1989. The adjustment was based on the average difference between the City of Fresno DOF population and the City Water Division water service area population for 2001 through 2006. The resulting estimated historical water service area population is shown on Figure 3-2, indicating that the City’s water service area population is somewhat higher than the City of Fresno population.

Projected Future Water Service Area Population

In the future, the population of the City’s water service area is anticipated to continue to grow. Figure 3-3 shows the projected population to be served by the City Water Division. A range of projections has been made based on different projection methodologies. The first methodology

<sup>5</sup> Fresno County Council of Government website ([www.fresnocog.org](http://www.fresnocog.org)) “Census 1990-Census 2000 Population Growth Fresno County and its Jurisdictions.”

involved projecting the actual population served (as calculated by the City Water Division) using the 1.9 percent COG annual growth rate. This results in a service area population of approximately 692,203 in 2025 and 760,509 in 2030.

The City of Fresno General Plan (General Plan) has somewhat different projections, and assumes a higher starting population in 2000 for the Community Plan Area (482,495 as compared to the City Water Division estimate of 435,814 for April 2000). According to the General Plan, the population of the Community Plan Area will increase to 790,955 by 2025, representing an approximately 2 percent annual growth rate<sup>6</sup>. As shown on Figure 3-3, if the General Plan Community Plan Area grows at only a 1.9 percent annual rate (per the COG growth rate), buildout of the General Plan Community Plan Area would not occur until about 2026.

Table 3-2 summarizes both the high and low projected population estimates for the City’s water service area.

**Table 3-2. City of Fresno Water Service Area Population Projections (DWR Table 2)**

Population Projection	2000	2005	2010	2015	2020	2025	2030
High Estimate: General Plan Projection <sup>(a)</sup>	482,495	544,187	605,879	667,571	729,263	790,955	(b)
Low Estimate: Projection Per Water Division Estimates of Current Population Served and Uniform Growth Rate of 1.9% <sup>(c)</sup>	435,814	475,061	521,940	573,444	630,032	692,203	760,509

(a) 2025 City of Fresno General Plan, Table 1, Population Projection by Community Plan Area. 2025 population of 790,955 is considered to be buildout of the General Plan area.

(b) No projection available as buildout of the General Plan occurs in 2025.

(c) Growth rate of 1.9 percent per Fresno County Council of Governments ([www.fresnocog.org](http://www.fresnocog.org)).

## Water Customers

### Affordable Housing Units

*10631.1 (a) The water use projections required by 10631 shall include projected water use for single-family and multi-family residential housing needed for lower income households as identifies in the housing element of any city or county in the service area of the supplier.*

Senate Bill 1087 (SB 1087) approved in October 2005 amended a portion of the Water Code related to the preparation of UWMPs. It requires that UWMPs include water use projections for single-family and multi-family residential lower income households as identified in the housing element of any city or county in the service area of the supplier.

<sup>6</sup> 2025 City of Fresno General Plan, Table 1, Population Projections by Community Plan Area.

Per the City’s Planning and Development Department<sup>7</sup>, the number of existing lower income households within the City can be estimated based on information provided in the City’s June 2008 Housing Element. In the City’s Housing Element, lower income households are listed under two categories:

- Federal Housing and Urban Development (HUD) Federally Assisted Projects, and
- Low Income Housing Tax Credit Program Projects (State Assisted Projects).

The number of lower income households in these programs is listed in Table 3-3. As shown, all of the HUD Federally Assisted Projects and most of the Low Income Housing Tax Credit Program Projects are multi-family units (i.e., apartments).

As shown in Table 3-3, based on available data, there were approximately 4,800 lower income housing units in the City in 2008. Based on this data, the number of existing water connections for lower income households has been estimated. As shown in Table 3-3, for the single family residential units, each water service connection is assumed to serve one household unit. Therefore, in 2007 it is estimated that only 0.007 percent of the total single family residential water connections were lower income households (8 out of a total of 107,107 total single family connections in 2007<sup>8</sup>).

**Table 3-3. 2002 City of Fresno Lower Income Households**

Program	Lower Income Single Family	Lower Income Multi-Family	Total Lower Income
HUD Federally Assisted Projects <sup>(a)</sup>	0	1,991	1,991
Low Income Housing Tax Credit Program Projects <sup>(b)</sup>	8	2,800	2,808
Total Lower Income Housing Units in 2008	8	4,791	4,799
Total Number of Water Connections in 2007 <sup>(c)</sup>	107,107	8,297	115,404
Estimated Number of Housing Units per Water Connection <sup>(d)</sup>	1	10	--
Estimated Total Number of Housing Units in 2007 (Number of Water Connections x Housing Units per Water Connection)	107,107	82,970	190,077
Percent of Total Housing Units Estimated to be Lower Income <sup>(e)</sup>	0.007%	5.8%	2.5%

<sup>(a)</sup> Table 4-14, City of Fresno Housing Element dated June 2008.

<sup>(b)</sup> Table 4-15, City of Fresno Housing Element dated June 2008. Some projects listed in the Housing Element Table 4-15 were also listed in Housing Element Table 4-14 and have been subtracted out to avoid double-counting of projects.

<sup>(c)</sup> City of Fresno DWR Public Water System Statistics Report for 2007 Calendar Year.

<sup>(d)</sup> Based on January 2007 population (493,285) and assumed number of people per housing unit (about 2.9 people per single family housing unit and 2.2 people per multi-family housing unit).

<sup>(e)</sup> Total lower income units in 2008 divided by 2007 total dwelling units.

<sup>7</sup> E-mail from Sara Pomare, City of Fresno Planning and Development Department dated July 23, 2008.

<sup>8</sup> Source: City of Fresno Public Water System Statistics Report for Calendar Year 2007.

For the multi-family residential housing units, each water service connection serves multiple housing units (i.e., one water service connection serves a number of apartment units). Based on the January 2007 population (493,285) and the number of single family and multi-family water connections in 2007, and an assumed number of people per housing unit (about 2.9 people per single family housing unit and 2.2 people per multi-family housing unit), it is estimated that each multi-family water connection serves an average of 10 multi-family housing units. Therefore, the number of 2007 multi-family water connections (8,297) is estimated to serve 82,970 multi-family housing units (10 units/connection x 8,297 connections), which means that the 4,791 lower income multi-family housing units in 2008 equated to about 5.8 percent of the total multi-family housing units in 2007 (4,791 housing units out of a total of 82,970 total multi-family housing units in 2007<sup>9</sup>).

These estimated percentages are used below to estimate the number of existing and future lower income households and water service connections and will be used in Chapter 6 of this UWMP to estimate the existing and projected future water demand for lower income households.

### Water Connections

In 2007, the City had approximately 130,167 water service connections<sup>10</sup>. Approximately 83 percent of these connections are single-family residential, which are currently unmetered. The remaining 17 percent of the connections are multi-family residential, commercial/institutional, industrial, landscape irrigation, and fire service connections. Table 3-4 provides a summary of the City's water connections in 2007.

---

<sup>9</sup> Source: City of Fresno Public Water System Statistics for Calendar Year 2007.

<sup>10</sup> Source: City of Fresno Public Water System Statistics Report for Calendar Year 2007.

**Table 3-4. City of Fresno 2007 Water Service Connections<sup>(a)</sup>**

Land Use Type	Number of Connections in 2007	Percent of Total Connections
Single-Family Residential		
Estimated Market Value	107,099	82.3%
Estimated Lower Income <sup>(b)</sup>	8	0.0%
	107,107	82.3%
Multi-Family Residential		
Estimated Market Value	7,451	5.7%
Estimated Lower Income <sup>(c)</sup>	479	0.4%
	7,930	6.1%
Commercial/Institutional	9,211	7.1%
Industrial	121	0.1%
Landscape Irrigation	3,016	2.3%
Other	72	0.1%
Fire Service	2,710	2.1%
<b>Total Connections</b>	<b>130,167</b>	<b>100.0%</b>

<sup>(a)</sup> City of Fresno Public Water System Statistics Report for Calendar Year 2007.

<sup>(b)</sup> Estimated based on overall percentage of lower income single family households estimated for 2007, 0.007 percent (see discussion above).

<sup>(c)</sup> Estimated based on overall percentage of lower income multi-family households estimated for 2007, 5.8 percent (see discussion above).

In the future, the number of water connections is anticipated to increase. The projected future number of water connections, by land use type, has been estimated based on future projected General Plan land use, current development densities, and projected future development densities and are presented in Table 3-5.

**Table 3-5. City of Fresno Future Projected Water Service Connections<sup>(a)</sup>**

Land Use Type	2000 <sup>(b)</sup> (Actual)	2005 <sup>(b)</sup> (Actual)	2010	2015	2020	2025	2030
Single-Family Residential							
Estimated Market Value	95,143	103,506	120,818	137,520	154,223	170,925	187,627
Estimated Lower Income <sup>(c)</sup>	<u>7</u>	<u>7</u>	<u>8</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>
	95,150	103,513	120,826	137,530	154,233	170,937	187,641
Multi-Family Residential							
Estimated Market Value	6,901	7,088	7,663	8,262	8,862	9,462	10,061
Estimated Lower Income <sup>(d)</sup>	<u>425</u>	<u>436</u>	<u>472</u>	<u>509</u>	<u>546</u>	<u>583</u>	<u>619</u>
	7,326	7,524	8,135	8,771	9,408	10,044	10,681
Southeast Growth Area	0	0	9,876	19,752	29,628	39,504	49,379
Commercial/Institutional	7,416	7,882	8,086	9,472	10,858	12,244	13,631
Industrial	106	96	96	130	164	197	231
Landscape Irrigation	1,516	2,243	2,313	2,410	2,507	2,604	2,701
Fire Service	395	2,568	2,960	3,503	4,047	4,590	5,133
<b>Total Connections</b>	<b>111,909</b>	<b>123,826</b>	<b>152,292</b>	<b>181,568</b>	<b>210,844</b>	<b>240,121</b>	<b>269,397</b>

(a) Estimated based on future projected General Plan land use, current development densities and projected future development densities. Land use values for 2015 and 2020 interpolated from 2010 and 2015 data. Land use values for 2030 extrapolated from 2025 data.

(b) 2000 and 2005 actual data based on City of Fresno DWR Public Water System Statistics for calendar year 2000 and 2005.

(c) Based on overall percentage of lower income single family households estimated for 2007, 0.007 percent (see discussion above and Table 3-3).

(d) Based on overall percentage of lower income multi-family households estimated for 2007, 5.8 percent (see discussion above and Table 3-3). One multi-family residential water service connection is estimated to serve an average of about 10 multi-family housing units (e.g., apartments) (see Table 3-3).

## Service Area Characteristics

### Climate

The City of Fresno's service area is located in California's San Joaquin Valley in Fresno County along Highway 99. The climate of the area is best described as Mediterranean, characterized by hot dry summers and cool winters. Precipitation in the area averages around 11 inches per year as shown in Table 3-6 which shows the average monthly temperature and rainfall for a weather station located near the Fresno airport. Average evapotranspiration ( $E_t$ ) is based on data from a monitoring station located at Fresno State University.

**Table 3-6. Climate Data (DWR Table 3)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Et <sub>o</sub> , inches <sup>(a)</sup>	0.85	1.63	3.23	5.23	6.96	7.97	8.65	7.64	5.41	3.59	1.68	0.85	53.69
Average Temperature, °F <sup>(b)</sup>	46.0	51.0	55.3	61.2	68.8	76.0	81.8	80.0	74.9	65.4	53.7	45.9	63.3
Average Max Temperature, °F <sup>(b)</sup>	54.4	61.5	66.9	74.6	83.4	91.6	98.1	96.2	90.5	79.8	65.2	54.6	76.4
Average Min Temperature, °F <sup>(b)</sup>	37.6	40.6	43.7	47.8	54.1	60.2	65.4	63.7	59.3	50.9	42.2	37.2	50.2
Average Rainfall, inches <sup>(b)</sup>	2.13	1.88	1.94	1.00	0.37	0.15	0.01	0.1	0.17	0.53	1.17	1.58	10.94

<sup>(a)</sup> Source: CIMIS Website: www.cimis.water.ca.gov, Station 80 Fresno State (1988 to Present), Monthly Average Et<sub>o</sub> Report, August 2006.

<sup>(b)</sup> Source: National Climatic Data Center, Climatology of the United States, Fresno WSO AP Weather Station (No. 043257), Period of Record 7/1/48 to 12/31/05.

These climate characteristics highly influence the City’s water use. As described in Chapter 6, the City’s water use in the summer months is significantly higher than that in the winter, reflecting increased water use for irrigation purposes during the hot, dry summers.

Other Demographic Factors

A number of other demographic factors also influence water use in the City. As discussed above, most of the City’s water customers are single-family residential homes, which are currently unmetered. Because they are unmetered, customers are unaware of the water that they actually use and have no real incentive for water conservation since they are billed on a monthly flat rate structure. This undoubtedly contributes somewhat to the high water demands experienced in the City in the summer months. As the City implements its Residential Water Metering Program (see Chapter 8 and Appendix I), fewer and fewer customers will be unmetered and more customers will become aware of the quantity of water they use, and the need for and benefits of water conservation. As this occurs, summertime residential water demands will likely decrease somewhat.

The City also has a number of food processing facilities that use large amounts of water throughout the year, particularly in the summer when fruits and vegetables are being harvested and processed.

## **EXISTING WATER SYSTEM**

### **Historical Overview**

The original Fresno water system began operations in 1876 as a non-profit organization inaugurated by a group of public-minded citizens. Initially, the water system consisted of one pumping station composed of small pumps and two storage tanks located above the second floor of one of the early store buildings. This building was located on Fresno Street between "J" and "K" Streets, presently known as Broadway and Fulton.

By 1888, the town had grown to a small city, which demanded an improved water distribution system. This was necessary because of several large fires, including the destruction of the first permanent courthouse. In 1888, the first pumping station and water tower, of a permanent nature, were constructed at Fresno and "O" Streets. These facilities were designed to be an integral part of a larger and continually expanding water system. This No. 1 station was in continuous use until 1959, when it was retired having served its useful purpose. Today, this building is known as the "Water Tower" and has been declared a historic structure.

Between the years of 1887 and 1890, 4-inch and 2½-inch cast iron pipe, as well as 4-inch wrought iron water mains were laid out. Some of these original "permanent pipes" are still an integral part of the present water supply system.

The owner and operator of the system in 1888 was the Fresno Water Company. In 1904, the Fresno Water Company was purchased by Balch, Kerckhoff & Wishon, and was reorganized as the Fresno City Water Company. In 1926, the plant and distribution system was purchased by the California Water Service Company. This Company then sold the water system to the City of Fresno in 1931, which operated as a municipal utility. It was first managed under an appointed water board, but currently is a Division of the Public Utilities Department.

Historically, the City's supply of water consisted of direct pumping from wells drilled into the underground aquifer. Today, groundwater remains as the City's primary water supply source, and there are presently about 250 municipal groundwater wells located throughout the City.

In the 1960s, the City purchased surface water made available from the United States Bureau of Reclamation (USBR). The City contracted with USBR for 60,000 acre-feet of water per year from the Friant Division (Millerton Lake) and developed a system to recharge the groundwater basin by "intentional recharge," percolating the imported surface water supplies in constructed recharge basins. The City's USBR supplies are conveyed to the City via Fresno Irrigation District (FID) canals. In 1976, the City signed a contract with the FID for delivery of surface water supplies from the Kings River based on the City's pro rata share of FID's water entitlements. The City also obtains surface water from the Fresno Irrigation District (FID) for groundwater recharge purposes.

In 2004, the City also began treating surface water supplies for direct potable use at its new Surface Water Treatment Facility (SWTF). The SWTF located in northwest Fresno currently provides about 12 percent of the City's potable water supplies<sup>11</sup>.

### **Existing Water System**

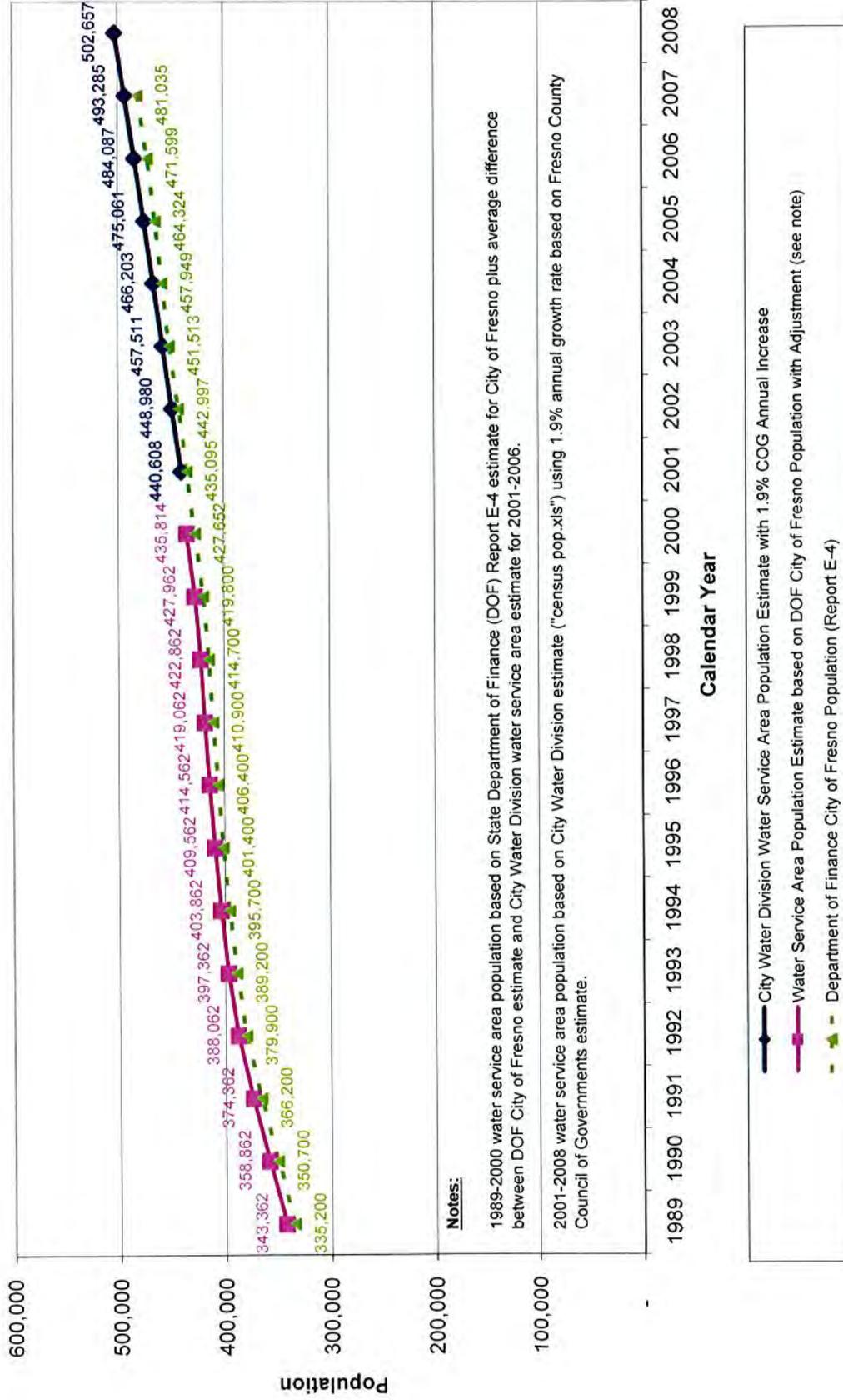
The City's existing water system consists of about 1,740 miles of transmission and distribution pipelines, 250 operational groundwater wells, a 30 mgd surface water treatment facility, storage facilities, and booster pump facilities. The distribution system is divided into four quasi-pressure zones to help regulate minimum and maximum system pressures in the various topographic areas of the City. Figure 3-4 shows the City's existing water system facilities.

---

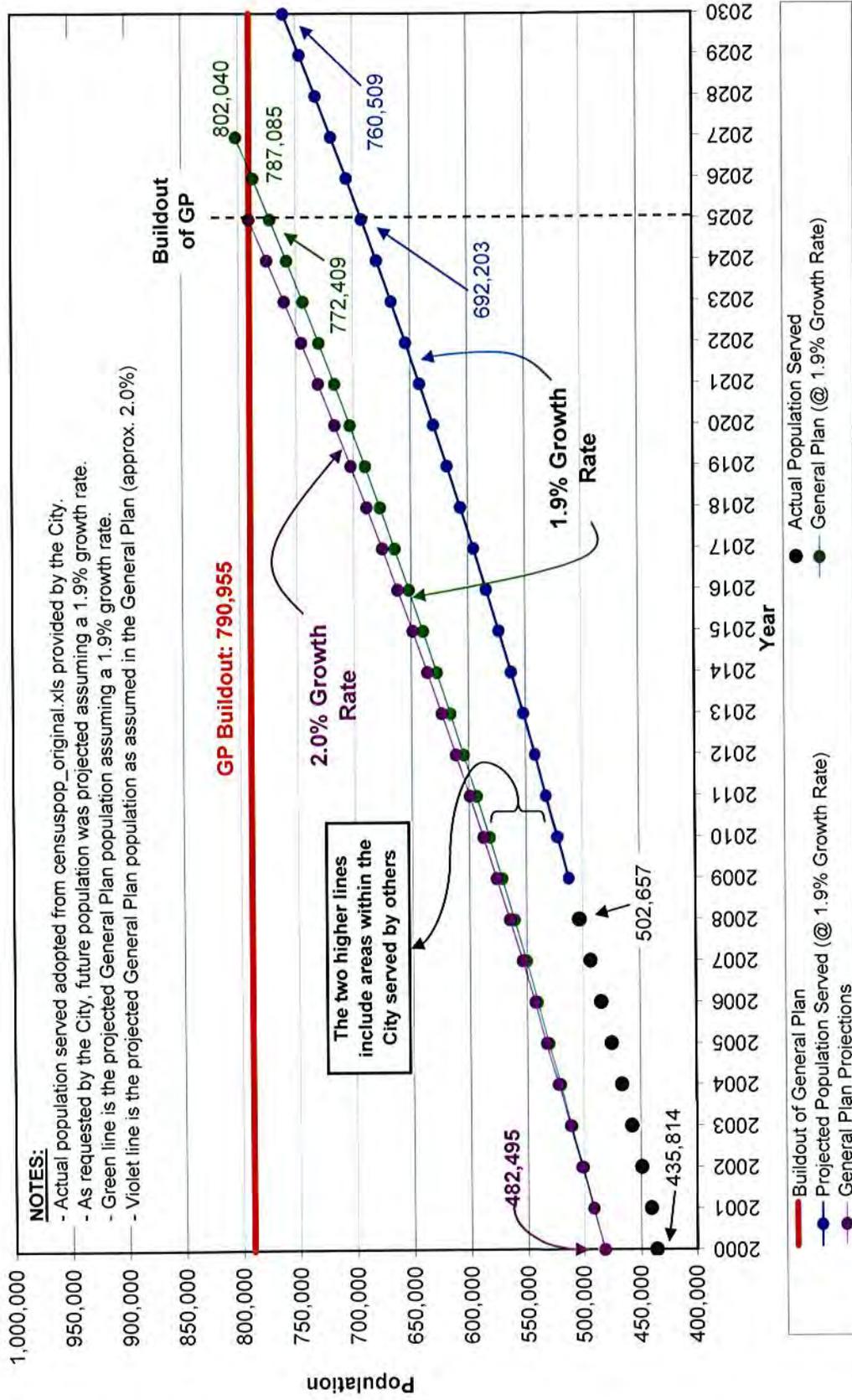
<sup>11</sup> Based on 2007 production data (Source: pumpingstats.xls obtained from City). Total water production in 2007 was 165,798 acre-feet. Deliveries from the Surface Water Treatment Facility were 20,650 acre-feet. Remaining production of 145,148 acre-feet, was from groundwater.



Figure 3-2. City of Fresno Water Service Area Estimated Historical Population



**Figure 3-3. Projected Population Served by the City**







Because historical data was not available on a daily basis, WYA evaluated annual quantities of diversions to evaluate Kings River entitlements and diversions. Actual diversions may be different at a more refined timestep; however, actual data at a more refined timestep was not available. FID's historical "pre-project" water entitlements on the Kings River from 1964 to 2002 were obtained from the Kings River Water Association (KRWA), and are presented in column 2 of Table 4-1. The KRWA did not have data available after 2002. Although the entitlement numbers presented in Table 4-1 do not include any of FID's Class 2 USBR supplies, they do include water that may have been stored by FID in Pine Flat Reservoir. Consequently, the difference between the entitlement and actual FID releases was used to determine the portion of FID's Kings River supply that is applicable to the City's agreements.

The actual diversions were calculated by subtracting the sum of flows at the turnout from the Friant-Kern Canal to the Kings River (downstream of the Gould headgate) and within Lone Tree from the sum of flows in the Gould and Fresno canals; data was provided by WRIME. The actual releases from Pine Flat Reservoir for FID are presented in column 7 of Table 4-1. The difference between the "pre-project" entitlement and the actual diversion (see column 8 of Table 4-1) indicates the quantity of FID's Kings River water applicable to the City's agreements. If the difference between the "pre-project" entitlement and the actual diversion is less than zero, then it implies that FID released stored water and therefore, the quantity of FID's Kings River water applicable to the City's agreement is equal to the entitlement, not the actual diversion. If the difference between the "pre-project" entitlement and the actual diversion is greater than zero, then it implies that FID stored some of its entitlement within Pine Flat Reservoir and therefore, the quantity of FID's Kings River water applicable to the City's agreements is equal to the actual diversion, not the entitlement.

Water delivered from the Kings River is of extremely good quality, as these waters originate from snowmelt in the high sierras that has not been subjected to detrimental influences.

#### *Percent Allocation of FID Supply to the City*

In accordance with the City's 1976 agreement with FID, the actual water supply available to the City is a percentage of FID's diversion from the Kings River. The percentage is based on the ratio of the total area annexed by the City, compared to the total area within FID's water service area, including the area served by the City. Hence, the water available to the City through its contract with FID will increase over time as the City annexes additional lands within FID's water service area.

The City's percentage allocation for 2005 was provided by FID, while the allocations for 2010, 2025, and 2030 were calculated by WYA. Allocations for intermediate years were based on a straight-line interpolation. Table 4-2 presents the City's estimated allocation percentages. As shown, the percentage of FID's total Kings River diversion available to the City increases over time.

Table 4-1. FID Kings River Water Supply Applicable to the City's Agreements

Year <sup>(1)</sup>	[11]		[12]		[13]		[14]		[15]		[16]		[17] = [3]+[4]+[5]+[6]		[8] = [2]-[7]	[9] = see notes	[10] = see notes	[11] = see notes
	Pie-Project Entitlement <sup>(b)</sup>	Gould	Fresno	Actual Divisions <sup>(c)</sup>	Lone Tree	Kings River Turnout	FID Supply	Difference	Applicable Diversion <sup>(d)</sup>	Calculated FID Pine Flat Storage <sup>(e)</sup>	Spill Water Available to Others							
1964	342,611	93,435	297,176	(29,332)	(9,507)	352,312	(9,701)	342,611	109,299	0								
1965	539,579	114,325	477,925	(28,283)	0	563,467	(23,888)	539,579	95,112	0								
1966	407,538	96,334	387,030	(29,185)	(1,262,16)	322,963	84,575	322,963	119,000	0								
1967	653,736	144,319	535,695	(35,490)	(2,752,44)	371,280	282,456	371,280	119,000	163,456								
1968	347,123	99,126	337,098	(28,385)	(78,199)	329,640	17,483	329,640	119,000	0								
1969	716,535	136,448	493,312	(27,210)	(24,517)	578,033	138,502	578,033	119,000	19,502								
1970	450,050	107,267	426,493	(40,463)	(11,414)	391,883	58,167	391,883	119,000	0								
1971	424,858	131,156	414,570	(24,644)	(11,813)	408,269	16,589	408,269	119,000	0								
1972	371,633	103,229	300,907	(26,994)	(59,026)	318,206	53,427	318,206	119,000	0								
1973	523,188	133,866	456,126	(23,239)	(255,580)	310,594	212,594	310,594	119,000	93,594								
1974	526,572	29,185	457,690	(39,067)	(198,707)	348,501	178,071	348,501	119,000	59,071								
1975	463,331	127,297	442,809	(34,655)	(63,009)	472,442	(9,111)	463,331	109,889	0								
1976	232,237	71,716	193,907	(13,894)	(16,237)	235,472	(3,215)	232,257	115,785	0								
1977	204,694	60,618	171,725	(15,617)	(14,426)	202,300	2,394	202,300	119,000	0								
1978	660,883	149,470	458,078	(35,483)	(1,25,177)	446,888	213,995	446,888	119,000	94,995								
1979	486,175	141,849	412,520	(40,473)	(147,973)	365,923	120,252	365,923	119,000	1,252								
1980	609,463	154,402	461,641	(48,305)	(66,953)	500,785	108,678	500,785	119,000	0								
1981	357,435	115,008	343,364	(26,674)	(72,749)	360,949	(3,514)	357,435	115,486	0								
1982	673,906	130,545	425,988	(15,547)	(74,379)	466,607	207,299	466,607	119,000	88,299								
1983	728,071	132,709	372,134	(21,085)	(16,927)	466,831	261,240	466,831	119,000	142,240								
1984	528,641	147,229	496,292	(23,265)	(1,24,455)	495,801	32,840	495,801	119,000	0								
1985	419,923	122,759	470,591	(23,989)	(56,740)	510,621	(90,688)	419,923	28,302	0								
1986	618,996	139,390	455,392	(29,433)	(62,385)	502,964	116,032	502,964	119,000	0								
1987	311,228	78,900	283,784	(16,423)	(34,560)	311,701	(473)	311,228	116,619	0								
1988	357,786	94,224	331,023	(19,967)	(45,113)	360,167	(2,381)	357,786	113,364	0								
1989	356,434	113,821	342,639	(23,618)	(70,772)	362,070	(5,636)	356,434	113,364	0								
1990	314,025	78,919	226,079	(18,964)	(4,350)	281,684	32,341	281,684	119,000	0								
1991	382,060	114,505	316,033	(19,470)	(66,098)	344,770	37,290	344,770	119,000	0								
1992	282,849	113,715	274,971	(17,374)	(29,615)	341,697	(58,848)	282,849	60,152	0								
1993	563,546	134,517	539,341	(32,015)	(169,220)	472,623	90,923	472,623	119,000	0								
1994	338,731	110,853	289,135	(17,166)	(35,612)	347,190	(8,459)	338,731	110,541	0								
1995	651,929	108,645	449,556	(29,386)	(60,074)	468,741	183,188	468,741	119,000	64,188								
1996	538,552	130,304	457,156	(28,204)	(82,122)	477,134	61,418	477,134	119,000	0								
1997	530,326	129,906	457,028	(32,668)	(71,879)	482,487	67,839	482,487	119,000	0								
1998	634,477	104,779	374,043	(26,172)	(60,673)	391,977	242,500	391,977	119,000	123,500								
1999	411,485	109,702	434,026	(25,536)	(107,627)	410,365	920	410,365	119,000	0								
2000	430,945	119,073	422,498	(27,555)	(85,926)	428,090	2,855	428,090	119,000	0								
2001	336,599	96,005	256,642	(17,131)	(56,139)	279,377	57,222	279,377	119,000	0								
2002	372,040	93,679	383,117	0	(59,678)	419,118	(47,078)	372,040	71,922	0								

<sup>(1)</sup> Calendar year.

<sup>(b)</sup> Data provided by the Kings River Water Association.

<sup>(c)</sup> Data provided by WRIME.

<sup>(d)</sup> If the difference between the "pre-project" entitlement and the actual diversion (i.e., [2] - [7]) is less than zero, then it implies that FID released stored water and therefore, the quantity of FID's Kings River water applicable to the City's agreements is equal to the entitlement, not the actual diversion.

<sup>(e)</sup> If the difference between the "pre-project" entitlement and the actual diversion (i.e., [2] - [7]) is greater than zero, then it implies that FID stored some of its entitlement within Pine Flat Reservoir and therefore, the quantity of FID's Kings River water applicable to the City's agreements is equal to the actual diversion, not the entitlement.

<sup>(f)</sup> FID's website indicates that max storage available in Pine Flat is 11.9% of 1 million AF, or 119,000 af.

<sup>(g)</sup> Any year in which the entitlement exceeds the actual diversion, and FID's storage in Pine Flat is full, will result in excess entitlement (spill water) being released.

**Table 4-2. Projected Allocation of FID Kings River Diversion to the City of Fresno<sup>(a)</sup>**

	Projected Allocation of FID Kings River Diversion to City of Fresno, %					
	2005	2010	2015	2020	2025	2030
Projected Allocation	23.63%	24.30%	27.01%	29.73%	32.44%	34.17%

<sup>(a)</sup> Allocation in 2005 was provided by FID, allocation for 2010, 2025, and 2030 are based on WYA's GIS, and the allocation for other years is based on interpolation.

The surface water available for the City to purchase, based on its 1976 agreement with FID, was determined by multiplying the percentage allocation in Table 4-2 by the estimated diversion quantities. Table 4-3 presents the FID Kings River water available to the City during normal years. Availability and reliability during other hydrologic conditions is discussed in Chapter 5 of this UWMP.

**Table 4-3. FID Kings River Diversions Available to the City of Fresno during Normal Years**

Classification	FID Kings River Diversions Available to the City in Normal Years, af/yr					
	2005	2010	2015	2020	2025	2030
Normal Years	92,200	94,800	105,400	115,900	126,500	133,300

Surface Water Available Under the City's USBR Contract

The City recently renewed its contract with the USBR, through the year 2045. USBR oversees diversions from the San Joaquin River through the Friant-Kern Canal of the Central Valley Project (CVP). The USBR owns the Friant-Kern Canal and the Friant Water Authority maintains and operates the Friant-Kern Canal. The City's total entitlement from the USBR is 60,000 acre-feet per year of Class 1 water. A copy of the City's contract with the USBR is provided in Appendix D of this UWMP.

USBR Class 1 water is generally water available from Millerton Lake, and is a very dependable water supply, regardless of the type of hydrologic water year. Class 2 water is generally any excess water available as determined by USBR, and is not considered as dependable as Class 1 water.

The water from the San Joaquin River is of extremely good quality; these waters also originate from snowmelt in the high sierras that have not been subjected to detrimental influences.

Table 4-4 presents the USBR surface water available to the City during normal years (about 97 percent of total entitlement). Availability and reliability during other hydrologic conditions is discussed in Chapter 5 of this UWMP.

**Table 4-4. USBR Entitlement Available to the City during Normal Years**

Classification	USBR Supply Available to the City in Normal Years, af/yr					
	2005	2010	2015	2020	2025	2030
Normal Years	58,200	58,200	58,200	58,200	58,200	58,200

Surface Water Supply Available through the City’s Wastewater Recycle Exchange

In addition to the contracts with FID, as described above for a portion of its Kings River entitlement, the City also has a contract with FID that allows the City to pump groundwater developed through the percolation of previously treated wastewater effluent. This percolated water is then extracted and pumped into FID canals for delivery to downstream customers.

In return, the agreement states that FID will provide the City with surface water from either its Kings River entitlement or its Class 2 USBR water “insofar as is feasible and practical.” The quantity of surface water that FID is required to provide is limited to 46 percent of the groundwater that the City pumps into FID’s delivery canal, and the contract limits the annual quantity that can be pumped into FID’s canals to 30,000 afa, or 100,000 af over a 10-year period.

Historically, the City has percolated as much as 65,100 af of treated effluent, and pumped as much as 32,300 af per year into FID canals. Over the maximum 10-year period from 1996 to 2005, the City pumped 230,327 af into FID canals, exceeding the 100,000 af limit. Discussions with City staff indicate that, to date, the City has not requested that FID supply surface water to the City to replace the groundwater pumped into the FID delivery canals. However, based on a 46 percent return from FID, the City should be able to obtain 13,800 af of Kings River water from FID. For planning purposes, it was assumed that “insofar as is feasible and practical” implied that FID could supply up to 13,800 af of surface water supply during all hydrologic conditions.

The quality of the surface water that the City would receive through this FID contract is identical to the water quality it receives from either the Kings River or the USBR.

Table 4-5 presents the recharge water available to the City during normal years. Availability and reliability during other hydrologic conditions is discussed in Chapter 5 of this UWMP.

**Table 4-5. Recharge Water Available to the City during Normal Years**

Classification	Recharge Water Available to the City in Normal Years, af/yr					
	2005	2010	2015	2020	2025	2030
Normal Years	13,800	13,800	13,800	13,800	13,800	13,800

Summary of Existing and Future Surface Water Supplies

Table 4-6 provides a summary of the City’s existing and projected surface water supplies based on the information described above. As shown, the City’s projected future surface water supplies in normal years are expected to increase to 205,300 af/yr by 2030 as the City’s supply from the FID Kings River increases. However, the City currently only has a treatment capacity of 28,300 to 30,800 af/yr based on its existing Surface Water Treatment Facility (SWTF). In the future (as discussed below), the City plans to construct an additional SWTF in the southeast portion of the City and also expand the existing SWTF. These planned future capacities are shown in Table 4-6.

**Table 4-6. Existing and Future Surface Water Supplies during Normal Years**

Surface Water Supply	Existing and Future Surface Water Supplies during Normal Years, af					
	2005	2010	2015	2020	2025	2030
FID Kings River	92,200	94,800	105,400	115,900	126,500	133,300
USBR	58,200	58,200	58,200	58,200	58,200	58,200
Recharge Water	13,800	13,800	13,800	13,800	13,800	13,800
Total Surface Water Supply in Normal Years	164,200	166,800	177,400	187,900	198,500	205,300
Planned Future Surface Water Treatment Capacity <sup>(a, b)</sup>	15,807 (actual)	30,800	92,500	123,400	123,400	123,400

- (a) The SWTF currently has the operational capacity to deliver up to 27.5 million gallons per day (mgd) of treated surface water supplies (28,300 af/yr assuming that the SWTF is down for one month of the year for maintenance activities). The design capacity for the SWTF is 30 mgd (30,800 af/yr). For purposes of this UWMP, it has been assumed that the existing SWTF will operate at design capacity by 2010.
- (b) Planned future treatment capacity includes the existing SWTF at 30 mgd by 2010, a new 60 mgd SWTF to be located in the southeast portion of the City by 2015, and expansion of the existing SWTF to 60 mgd by 2020. Annual treatment capacity assumed that the SWTFs are down for one month of the year for maintenance activities.

**Existing and Future Groundwater Supplies**

Groundwater Overview

The City is one of many water purveyors that use groundwater from the Kings Subbasin, which is part of the greater San Joaquin Valley Groundwater Basin (SJV Basin). The City currently operates approximately 250 municipal supply wells within the Kings Subbasin, and until late 2004, relied solely on pumped groundwater to meet the water demands within its service area.

Groundwater Management

*10631 (b)(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.*

In 2006, the Fresno Area Regional Groundwater Management Plan (FARGMP) was prepared to comply with AB 3030 and SB 1938. Participating agencies, including the City, adopted the FARGMP in 2006. Participating agencies and adoption dates are listed in Table 4-7.

**Table 4-7. Groundwater Management Plan Participants**

Agency	Adoption Date
Fresno Irrigation District	01/25/2006
Fresno Metropolitan Flood Control District	02/08/2006
City of Clovis	02/13/2006
Malaga County Water District	02/14/2006
City of Kerman	03/01/2006
Bakman Water Company	03/13/2006
<b>City of Fresno</b>	<b>04/18/2006</b>
County of Fresno	07/18/2006
Pinedale County Water District	09/20/2006
Garfield Water District	11/01/2006

The FARGMP boundaries generally coincide with FID, but also include a small area northeast of FID. The objectives of the FARGMP have been developed to monitor, protect, and sustain groundwater within the region. Specific objectives include the following:

- Preserve and enhance the existing quality of the area’s groundwater;
- Correct the overdraft and stabilize groundwater levels at the highest practical beneficial levels;
- Preserve untreated groundwater as the primary source of domestic water;
- Maximize the available water supply, including conjunctive use of surface water and groundwater;
- Conserve the water resource for long-term beneficial use and assure an adequate supply for the future;
- Manage groundwater resources to the extent necessary to ensure reasonable, beneficial, and continued use of the resource;
- Monitor groundwater quality and quantity to provide the requisite information for establishing groundwater policies, goals, and recommended actions; and
- Improve coordination and consistency among agencies responsible for the monitoring and management of groundwater in the Plan Area.

Although FID led the development of the FARGMP, the October 2005 Memorandum of Understanding between the participating agencies makes it clear that each participating agency retains authority and responsibility for groundwater management within its own jurisdiction.

A copy of the Fresno Area Regional Groundwater Management Plan is provided in Appendix E of this UWMP.

### Description of Groundwater Basin

*10631 (b)(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which 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.*

As described below, the City of Fresno overlies the Kings Subbasin of the San Joaquin Valley Groundwater Basin. The Kings Subbasin (DWR Basin No. 5-22.08) underlies Fresno, Kings, and Tulare Counties and has a surface area of 976,000 acres (1,530 square miles).

#### *Basin Location*

The SJV Basin comprises the southern portion of the Great Central Valley of California, and is bounded to the north by the Sacramento-San Joaquin Delta and Sacramento Valley, to the east by the Sierra Nevadas, to the south by the San Emigdio and Tehachapi Mountains, and to the west by the Coast Ranges.

The Kings Subbasin, located within the southern half of the SJV Basin, is bounded to the north by the San Joaquin River, to the east by the alluvium-granite rock interface of the Sierra Nevada foothills, and to the west by the Delta-Mendota and Westside Subbasins. The Kings Subbasin is bounded to the south by the northern boundary of the Empire West Side Irrigation District, the southern fork of the Kings River, the southern boundary of the Laguna Irrigation District, the northern boundary of the Kings County Water District, and the western boundary of Stone Corral Irrigation District. Figure 4-1 illustrates the location of the City relative to the boundaries of the Kings Subbasin.

#### *Area Geology*

The upper several hundred feet within the Kings Subbasin generally consists of highly permeable, coarse-grained deposits, which are termed older alluvium. Coarse-grained stream channel deposits, associated with deposits by the ancestral San Joaquin and Kings Rivers, underlie much of northwest Fresno. Additionally, a recent study completed in 2004 indicated the presence of a laterally extensive clay layer, at an average depth of approximately 250 feet below the ground surface, beneath most of the south and southeastern portions of the City.

Below the older alluvium to depths ranging from about 600 to 1,200 feet below ground surface, the finer-grained sediments of the Tertiary-Quaternary continental deposits are typically encountered. Substantial groundwater has been produced and utilized from these depths by the City; however, deeper deposits located in the southeastern and northern portions of the City have produced less groundwater.

There are also reduced deposits in the northern and eastern portions of the City, at depths generally below 700 or 800 feet, which are associated with high concentrations of iron, manganese, arsenic, hydrogen sulfide, and methane gas. Groundwater at these depths does not generally provide a significant source for municipal supply wells.

Figure 4-2 presents an idealized hydrogeologic cross-section that illustrates the general depth of various lithologic features within the Kings Subbasin, near the City.

*Aquifer Characteristics*

Transmissivity indicates the ability of an aquifer to transmit groundwater, while the specific capacity indicates the ability of a particular well to produce that water; hence, any future groundwater wells should be located in areas of higher transmissivity. As part of the City’s recent Metro Plan Update, aquifer test data (pump tests) were reviewed to evaluate available transmissivity and specific capacity data.

Table 4-8 summarizes the pump test data by general geographic location within the City (i.e., North, South, East, and West Fresno). As shown in Table 4-8, the northwestern and southwestern portions of the City have wells with higher transmissivities and higher specific capacities.

**Table 4-8. Summary of Groundwater Pump Tests within the City of Fresno<sup>(a)</sup>**

Area of the City	Date Range	Range of Pumping Rates, gpm	Range of Transmissivities, gpd/ft	Range of Specific Capacities, gpm/ft
North Fresno	1979 to 2005	500 to 2,450	10,000 to 179,000	6 to 57
Northwest Fresno	1969 to 1995	570 to 2,735	66,000 to 298,000	43 to 134
Southwest Fresno	1995 to 2006	1,510 to 2,515	57,000 to 369,000	26 to 92
Southeast Fresno	1987 to 2005	340 to 1,790	15,000 to 135,000	4 to 54
East Fresno	1987 to 2005	450 to 1,740	3,500 to 109,000	2 to 38

<sup>(a)</sup> All data provided by Kenneth D. Schmidt and Associates.

*Current Water Level Elevation and Flow Direction*

Water surface elevations for the shallow groundwater zone range from less than 190 feet to more than 300 feet above mean sea level, and a large cone of depression extends from Herndon Avenue to Jensen Avenue in the north-south direction, and from Maple Avenue and Brawley Avenue in the east-west direction. There is a large mound of groundwater near the Regional

Water Reclamation Facility (RWRF), which is due to the City's percolation of treated effluent (described below).

Water surface elevations for the deeper groundwater zone ranged from 185 to 230 feet above mean sea level, with a larger cone of depression extending to the northeast to a greater extent than the cone of depression observed for the shallow groundwater zone. The cone of depression within the deep groundwater bearing zone is likely associated with the development of new "moderately" deep groundwater wells constructed since the late 1980's in the northern portion of the City. The groundwater recharge mound, near the wastewater treatment plant, is not present in the deeper aquifer zone.

#### *Historical Water Level Trends*

Groundwater levels in the Fresno area have declined by an average of about 1.5 feet per year since 1990. The slowest groundwater-level declines (less than 0.5 feet per year) were generally observed in the southwestern portion of the City's downtown area, while groundwater-level declines increased to 1.0 foot per year northeast of the downtown area. Average groundwater-level declines as high as 1.5 feet per year were primarily observed in the northern and southeastern (near the Fresno Air Terminal) portions of the City. The largest average annual groundwater-level declines (3.0 feet per year) were observed in the northeastern area of the City, near Clovis.

Figure 4-3 shows water level hydrographs for six of the City's wells. As shown, hydrographs are shown for wells located in different parts of the City (South, North, West and East) and wells located near Leaky Acres (the City's primary recharge facility) and the RWRF. These wells were selected to demonstrate different groundwater level trends in different parts of the City. All of the wells indicated decreasing groundwater levels since 1990. However, all of the wells, except for the South Fresno well, have shown increases in water levels in the last one or two years, perhaps as a result of the introduction of treated surface water and/or intentional groundwater recharge activities in the vicinity of these wells and treated wastewater percolation near the RWRF. Also, there is incidental groundwater recharge which occurs due to seepage from the unlined FID canals located throughout the City.

As part of the Metro Plan hydrogeologic evaluation update, the City measured water levels in available nested monitoring wells in April 2006. These recent water level measurements, in conjunction with other available data from 2001, were used to develop groundwater elevation and direction of groundwater flow for the shallow aquifer zone (140 to 250 feet below ground surface) and the deeper aquifer zone (450 to 600 feet below ground surface).

Figures 4-4 and 4-5 illustrate the spring 2006 groundwater elevations and groundwater flow direction for both the shallow and deep aquifer zones, respectively. As shown in Figure 4-4, groundwater elevations for the shallow groundwater zone range from 190 feet to 300 feet above mean sea level, and a large cone of depression extends from about Herndon Avenue to Jensen Avenue in the north-south direction, and from about Maple Avenue to Brawley Avenue in the east-west direction. Figure 4-4 also indicates the presence of a large mound of groundwater near the wastewater treatment plant, which is due to the City effluent percolation activities (see additional discussion below).

As shown in Figure 4-5, groundwater elevations for the deeper groundwater zone ranged from 190 to 250 feet above mean sea level, with a larger cone of depression extending to the northeast to a greater extent than the cone of depression observed for the shallow groundwater zone. The cone of depression within the deep groundwater zone is likely associated with the development of new “moderately” deep groundwater wells constructed since the late 1980’s in the northern portion of the City. Figure 4-5 does not indicate the presence of a groundwater recharge mound near the wastewater treatment plant in the deeper zone.

### *Groundwater Overdraft*

Groundwater overdraft is defined by the California Department of Water Resources (DWR) as the condition of a groundwater basin or subbasin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years, during which the water supply conditions approximate average conditions<sup>1</sup>. In the DWR Bulletin 118-80 Ground Water Basins in California, published in 1980, critical overdraft was defined as follows:

*A basin is subject to critical conditions of overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts.*

In DWR Bulletin 118-80, eleven basins, including the Kings Subbasin, were identified as being in a critical condition of overdraft. The overdraft status of these basins was not re-evaluated by DWR in the DWR Bulletin 118-03; however, the DWR Bulletin 118-03 does acknowledge the groundwater recharge programs being conducted by the City of Fresno, FID, and FMFCD within the Kings Subbasin to ensure that groundwater will continue to be a viable water supply in the future. As described below, one of the City’s key objectives is to balance its groundwater operations by the year 2025, whereby groundwater pumpage equals groundwater recharge, to minimize the potential for further groundwater level declines and water quality impacts.

### Groundwater Quality

Groundwater within the Kings Subbasin generally meets primary and secondary drinking water standards for municipal water use, and is described as being a bicarbonate-type water, including calcium, magnesium, and sodium as the dominant ions. Generally, total dissolved solids (TDS) concentrations rarely exceed 600 mg/L, and typically range from 200 to 700 mg/L. However, the groundwater basin is threatened by chemical contaminants that affect the City’s ability to fully use the groundwater basin resources without some type of wellhead treatment in certain areas.

Many different types of chemical pollutants have contaminated portions of the Kings Subbasin underlying the City’s water service area. Some of the major contaminant plumes include 1,2-Dibromo-3-Chloropropane (DBCP), ethylene dibromide (EDB), trichloropropane (TCP), other volatile organic compounds (VOCs) such as trichloroethylene (TCE) and tetrachloroethylene (PCE), nitrate, manganese, radon, chloride, and iron. The City has received

---

<sup>1</sup> Chapter 6 Basic Groundwater Concepts, DWR Bulletin 118 California’s Groundwater, Update 2003.

settlements in a number of lawsuits related to these contaminants and has constructed wellhead treatment systems and implemented blending plans for a number of wells.

#### Estimated Groundwater Yield for the City

The estimated groundwater yield for the City has been estimated based on natural groundwater recharge and intentional groundwater recharge. These are described below.

##### *Natural Recharge*

With the recent completion of the groundwater model for the Metro Plan Update, average annual natural recharge for existing conditions has been estimated to be approximately 37,000 af/yr for the City SOI area, which includes the Pinedale, Bakman, and CSUF areas. In the future, as additional urbanization is assumed to occur, the groundwater model projects that the average natural groundwater recharge within the Fresno SOI will decrease to about 27,000 af/yr by 2025.

The City currently makes up about 64 percent of the pumpage within the SOI (average City pumpage 1990 to 2006 is about 139,000 af/yr as compared to SOI pumpage of 218,000 af/yr<sup>2</sup>); therefore, it is assumed that about 64 percent of the natural recharge, or about 23,700 af/yr, is currently available to the City. However, as the City expands into the SOI, the percent allocated to the City will continue to increase, until the entire natural recharge of the SOI, 27,000 af/yr, will be available to the City.

##### *Subsurface Inflow*

The groundwater model prepared for the Metro Plan Update, estimates subsurface inflow for the Fresno SOI to be approximately 65,000 af/yr. It is unclear how much of this subsurface inflow is available to the City; however, for purposes of this UWMP, it is estimated that 30,000 af/yr of subsurface inflow is currently available to the City (as of 2005). However, as the City balances its future groundwater operations, subsurface inflows and outflows should also be balanced and cancel each other out. Therefore, by 2025, it is assumed that there is no subsurface inflow available to the City.

##### *Intentional Groundwater Recharge with Surface Water*

There are a number of groundwater recharge basins in and around the City of Fresno operated by FMFCD, FID, the City of Fresno, and the City of Clovis. The City currently recharges these groundwater basins with surface water using several recharge facilities within its service area. A majority of these facilities are located in the north-central portion of the City, away from future expansion areas, such as the Southeast Growth Area. Additionally, some of the FMFCD basins are actually dual use (recharge and recreation) basins.

---

<sup>2</sup> WRIME November 2007 IGSM Report.

Since 1985, the City has recharged a maximum of about 62,000 af/yr (in 2003), and has averaged approximately 44,200 af/yr, with the majority of the recharge occurring at Leaky Acres and the FMFCD facilities (via interties provided by the City to the FMFCD basins). The overall variability to recharge water within each facility is likely due to a number of factors, which could include pond availability, water delivery season, pond maintenance, or length of wet seasons. In 2007, due to various factors including operational issues at existing recharge facilities and dry year conditions, the intentional recharge was only 38,100 af/yr. As described below, in the future, the City plans to significantly expand intentional groundwater recharge facilities to balance future groundwater operations.

Table 4-9 summarizes the estimated groundwater yield based on natural recharge, subsurface inflow, and intentional groundwater recharge.

**Table 4-9. Current Groundwater Pumping Rights (DWR Table 5)**

Basin Name	Current Pumping Right (2007), af/yr
San Joaquin Valley Groundwater Basin: Kings Subbasin	
Natural Recharge	23,700 af/yr <sup>(a)</sup>
Subsurface Inflow	27,000 af/yr <sup>(b)</sup>
Intentional Recharge	38,100 af/yr <sup>(c)</sup>
Total Estimated Groundwater Yield	88,800 af/yr

- <sup>(a)</sup> Based on the City’s estimated portion (64 percent) of Fresno SOI natural recharge (37,000 af/yr) based on recent work completed by WRIME in conjunction with the Metro Plan Update. In the future, this natural recharge within the Fresno SOI will further decrease to 27,000 af/yr as additional urbanization occurs; however, City’s portion will increase to 100 percent of SOI.
- <sup>(b)</sup> Based on estimated subsurface inflow currently available to the City (based on estimated 30,000 af/yr available in 2005 and decreasing to 0 af/yr by 2025 as the City balances its groundwater operations).
- <sup>(c)</sup> Based on 2007 intentional recharge. In the future, the City plans to increase intentional recharge to balance future groundwater operations (see Table 4-13).

Groundwater Pumpage

*Current Groundwater Pumpage*

10631 (b)(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.

Groundwater pumpage by the City over the last six years is summarized in Table 4-10. As shown, prior to 2004, the City relied 100 percent on groundwater. Since the SWTF was completed in 2004, reliance on groundwater has decreased somewhat.

**Table 4-10. Amount of Groundwater Pumped by City of Fresno (DWR Table 6)**

Basin Name	Groundwater Pumpage by City of Fresno, af/yr					
	2002	2003	2004	2005	2006	2007
San Joaquin Valley Groundwater Basin: Kings Subbasin	165,542	165,117	160,047	141,471	136,050	145,150
% of Total Water Supply	100%	100%	98%	90%	87%	88%

As shown in Table 4-10, groundwater pumpage over the last six years has exceeded the estimated groundwater yield of approximately 88,800 af/yr (based on natural recharge, subsurface inflow, and intentional groundwater recharge) (see Table 4-9). As described below, in the future the City plans to reduce groundwater pumpage quantities while at the same time increasing intentional groundwater recharge such that groundwater operations can be balanced by the year 2025 (see Table 4-13).

*Projected Groundwater Pumpage*

*10631 (b)(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.*

Table 4-11 summarizes the groundwater projected to be pumped by the City in the future in normal years. As shown, groundwater will continue to be an important component of the City’s supplies, even with the continued and proposed expanded availability of surface water supplies. In the coming years, as part of the City’s overall future water supply plan (described below), the City will decrease groundwater pumpage, while at the same time, increasing intentional groundwater recharge activities (further described below), such that groundwater operations can be in balance (i.e., annual pumpage equal to annual recharge) by the year 2025.

**Table 4-11. Amount of Groundwater Projected to be Pumped by City of Fresno (DWR Table 7)**

Basin Name	Groundwater Projected to be Pumped by City of Fresno, af/yr <sup>(a)</sup>				
	2010	2015	2020	2025	2030
San Joaquin Valley Groundwater Basin: Kings Subbasin	131,750	95,800	82,000	85,000	100,600
% of Total Water Supply	81%	51%	40%	36%	40%

<sup>(a)</sup> Based on normal year supply conditions.

As shown in Table 4-11, the amount of groundwater to be pumped in the future, as a percentage of total water supply, decreases over time as other water supply sources are expanded or introduced (see additional discussion below).

## PLANNED SUPPLY PROJECTS AND PROGRAMS

*10631 (h) 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, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), 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.*

As part of the City's Metro Plan Update, the City has developed a future water supply plan to meet future demands using currently available and new water supply sources. The plan consists of several components including:

- Expansion of the City's water conservation program,
- Expansion of the City's surface water treatment capacity,
- Continued use of groundwater in coordination with expansion of the City's intentional groundwater recharge program, and
- Development of a recycled water program for landscape irrigation use.

The projected use of these existing and future water supplies to meet future demands is shown on Figure 4-6. Each of these supplies is described below.

### Expansion of Water Conservation Program

Although technically not a new water supply, additional water conservation will be an important part of the City's future water supply plan. This is because additional water conservation will reduce projected demands, and thereby reduce the need for additional future supplies. The City currently has an extensive water conservation program in place (see Chapter 8), and additional conservation (approximately 10 percent for residential customers) is anticipated as the City's residential customers become metered. However, as described in Chapter 6, per capita water use by the City's customers is still relatively high when compared to other communities (e.g., the per capita water use in the City of Clovis in 2005 was 248 gpcd). Therefore, for the future, an additional 5 percent overall conservation by all customers is recommended starting in 2010 (to reduce the per capita water use to 257 gpcd once all of the reductions due to residential metering are achieved), and an additional 5 percent (10 percent total) by all customers is recommended starting in 2020 (to reduce the per capita water use to 243 gpcd). These additional conservation savings are shown on Figure 4-6. These additional savings would be achieved through expansion of the City's existing water conservation programs and introduction of new water conservation programs (see Chapter 8).

These recommended reductions in per capita water use are also consistent with Governor Arnold Schwarzenegger's February 2008 call for reducing per capita water use statewide by 20 percent by 2020. Further discussion of this additional conservation is provided in Chapter 6 of this UWMP.

In addition, as discussed in Chapter 7, in accordance with the Water Shortage Contingency Plan provided in Chapter 9, projected demands in the third and fourth years of a multiple dry year period are assumed to be reduced by 10 percent due to mandated conservation measures consistent with dry year conditions. For the fifth year of a multiple dry year period, projected demands are assumed to be reduced by 15 percent due to mandated conservation measures consistent with critically dry year conditions.

### Expansion of Surface Water Treatment Capacity

Figure 4-6 shows the amount of surface water proposed to be treated at the City's existing, expanded, and new water treatment plants in the future. As shown, surface water treatment is proposed to increase from the current capacity of 27.5 mgd (28,300 af/yr) to 120 mgd (123,400 af/yr) by 2020. This increase in treatment capacity is proposed to occur as follows:

- Existing SWTF:
  - Currently 27.5 mgd (28,300 af/yr)
  - Increase to 30 mgd by 2010 (30,800 af/yr)
  - Expanded to 60 mgd by 2020 (61,700 af/yr)
- New Southeast SWTF:
  - 60 mgd by 2015 (61,700 af/yr)

Table 4-12 shows the proposed use of available surface water supplies for treatment and direct use based on normal year conditions. Available surface water supplies not treated for direct use are proposed to be used for intentional groundwater recharge and/or groundwater banking (see below), so that essentially all of the City's available surface water supplies are utilized in the future.

Planned future treatment capacity is also based on the ability to keep the surface water treatment facilities operating at full capacity under most hydrologic conditions. As shown in Table 4-12, only in critically dry years would there be inadequate surface water supplies to operate the surface water treatment facilities at full capacity. Reliability of the City's surface water supply in critically dry years is discussed further in Chapter 5 and is summarized in Table 4-12.

**Table 4-12. Projected Future Surface Water Treatment Capacity**

Treatment Facility	Projected Future Surface Water Treatment Capacity, af/yr				
	2010	2015	2020	2025	2030
Total Surface Water Supply in Normal Years (see Table 4-6)	166,800	177,400	187,900	198,500	205,300
Total Surface Water Supply in Dry Years (see Chapter 5)	130,900	139,600	148,300	157,000	162,600
Total Surface Water Supply in Critically Dry Years (see Chapter 5)	76,900	82,300	87,800	93,300	96,800
Existing Surface Water Treatment Facility	28,300	28,300	28,300	28,300	28,300
Expansion of Existing Surface Water Treatment Facility	2,500	2,500	33,400	33,400	33,400
New Southeast Surface Water Treatment Facility	--	61,700	61,700	61,700	61,700
Total Surface Water Treatment Capacity	30,800	92,500	123,400	123,400	123,400

**Expansion of Groundwater Recharge Program**

As shown in Table 4-11, future groundwater pumpage is assumed to decrease from current quantities as the City increases its surface water treatment capacity. However, in order to balance future groundwater operations (i.e., annual pumpage equal to annual recharge), and to offset the decrease in subsurface inflow (described above), intentional groundwater recharge operations will need to be increased.

As shown in Table 4-13, intentional groundwater recharge is projected to increase gradually over time, up to 73,700 af/yr by 2030, while natural groundwater recharge decreases over time (as described above). The increase in intentional recharge is assumed to occur due to the increased use of existing recharge basins and/or construction of new recharge basins and maximizing the use of available surface water supplies.

**Table 4-13. Projected Future Groundwater Recharge**

	Projected Groundwater Recharge, af/yr				
	2010	2015	2020	2025	2030
Natural Groundwater Recharge <sup>(a)</sup>	25,100	26,200	26,800	27,000	27,000
Subsurface Inflow <sup>(b)</sup>	22,500	15,000	7,500	0	0
Intentional Groundwater Recharge <sup>(c)</sup>	43,100	43,100	43,100	58,000	73,600
Total Groundwater Recharge <sup>(d)</sup>	90,700	84,300	77,400	85,000	100,600
Total Groundwater Pumpage (from Table 4-11)	131,750	95,800	82,000	85,000	100,600
Net Groundwater Recharge (Pumpage)	(41,050)	(11,500)	(4,600)	0	0

- (a) Represents City’s portion of natural recharge within Fresno SOI.
- (b) Represents City’s portion of subsurface inflow within Fresno SOI. Assume to be zero when groundwater operations are balanced in 2025.
- (c) Represents potential intentional recharge under normal year supply conditions, assuming that all available surface water supplies that are not treated for direct use are used for intentional groundwater recharge. Requires new recharge facilities.
- (d) Based on normal year supply conditions. In dry years, when surface water supplies may be reduced, groundwater recharge may be reduced.

As shown in Table 4-13, in 2010, 2015, and 2020, groundwater pumpage would continue to exceed groundwater recharge. However, based on normal year supply conditions, as a result of decreased groundwater pumpage and increased intentional groundwater recharge, it is projected that groundwater operations could be balanced (e.g., groundwater pumpage equal to groundwater recharge) by 2025 if sufficient recharge facilities are available. In dry years, groundwater recharge may be reduced due to reduced availability of surface water supplies. The City’s goal is to have balanced groundwater operations by no later than 2025, corresponding to buildout of the City’s General Plan.

As noted above, expansion of the groundwater recharge program does not directly provide a new supply to the City; however, it does allow the City to gradually bring groundwater operations into balance, whereby annual groundwater pumpage equals annual groundwater recharge.

**Development of Recycled Water for Landscape Irrigation**

Figure 4-6 shows the introduction of recycled water as a new source of supply starting in 2025. It is assumed that recycled water will be used in the Southeast Growth Area, and eventually other portions of the City, for landscape irrigation and/or other non-potable water purposes, thereby reducing the potable water demands.

These potential future recycled water uses are consistent with the City’s future plans to expand use of recycled water for landscape irrigation in new growth areas and throughout the City service area. These potential recycled water uses are based on the City’s new North Fresno Wastewater Reclamation Facility (WRF) (scheduled to be on-line in 2008) and the City’s future water supply plan developed in the Metro Plan Update.

In the next few years, the City will prepare a Recycled Water Distribution Master Plan to identify potential future recycled water use areas within the Southeast Growth Area, other future growth areas, and other areas within the City, as well as plan for the recycled water infrastructure required to serve these areas. In addition, the City will begin plans to provide the future tertiary treatment facilities required to meet the potential future landscape irrigation demands (see additional discussion below).

Table 4-14 summarizes the projected use of recycled water for landscape irrigation purposes in the future.

**Table 4-14. Projected Future Recycled Water Use for Landscape Irrigation Purposes**

	Projected Future Recycled Water Use for Landscape Irrigation Purposes, af/yr				
	2010	2015	2020	2025	2030
Southeast Growth Area and Other Areas Throughout the City	0	0	0	24,000	24,000
Copper River Ranch Golf Course	750	1,000	1,000	1,000	1,000
<b>Total Recycled Water Use for Landscape Irrigation</b>	<b>750</b>	<b>1,000</b>	<b>1,000</b>	<b>25,000</b>	<b>25,000</b>

Further discussion of the City’s proposed future use of recycled water is provided in Chapter 10 of this UWMP.

**Summary of Future Water Supply Projects**

Table 4-15 provides a summary of the City’s future water supply projects, and their anticipated availability in 2030. Reliability of these future supply projects is discussed further in Chapter 5, and is also summarized in Table 4-15.

**Table 4-15. Future Water Supply Projects (DWR Table 17)**

Project Name	Normal Year Supply to City (2030), af/yr	Single-Dry Year Supply to City, af/yr	Multiple-Dry Year Supply to City, af/yr				
			Year 1	Year 2	Year 3	Year 4	Year 5
Expansion of Water Conservation Program <sup>(a)</sup>	27,600	27,600	27,600	27,600	27,600	27,600	27,600
Expansion of Surface Water Treatment Capacity <sup>(b)</sup>	95,100	95,100	95,100	95,100	95,100	95,100	95,100
Expansion of Groundwater Recharge Program <sup>(c)</sup>	0	0	0	0	0	0	0
Development of Recycled Water for Landscape Irrigation	25,000	25,000	25,000	25,000	25,000	25,000	25,000
<b>Total</b>	<b>147,700</b>	<b>147,700</b>	<b>147,700</b>	<b>147,700</b>	<b>147,700</b>	<b>147,700</b>	<b>147,700</b>

- (a) Does not include additional mandated conservation measures which are assumed to be implemented in the third, fourth, and fifth years of a multiple-dry year period (see Chapter 7) per the City’s Water Shortage Contingency Plan (see Chapter 9).
- (b) Includes only expanded treatment capacity, not existing treatment capacity. Planned future treatment capacity provides that there will be adequate available surface water supplies to keep the treatment plants operating at essentially full capacity even in critically dry years.
- (c) Expansion of the groundwater recharge program does not directly provide a new supply to the City. Instead, it allows the City to gradually bring groundwater operations into balance, whereby annual groundwater pumpage equals annual groundwater recharge.

**TRANSFER AND EXCHANGE OPPORTUNITIES**

10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

As described previously, the City has an exchange agreement with FID which allows the City to pump groundwater developed through the percolation of previously treated wastewater effluent. This percolated water is then extracted and pumped into FID canals for delivery to downstream customers. In return, the agreement states that FID will provide the City with surface water from either its Kings River entitlement or its Class 2 USBR water “insofar as is feasible and practical.” The quantity of surface water that FID is required to provide is limited to 46 percent of the groundwater that the City pumps into FID’s delivery canal, and the contract limits the annual quantity that can be pumped into FID’s canals to 30,000 afa, or 100,000 af over a 10-year period (contract limit can be increased with approval from the FID Board). Based on historical operations, the City should be able to obtain 13,800 afa of Kings River water from FID through this exchange agreement.

As this is an existing agreement which can add to the City’s available surface water supplies from FID, it is included as part of the City’s existing surface water supplies (described above) and is not considered to be an additional supply source. A summary of the City’s water transfer and exchange opportunities is provided in Table 4-16.

**Table 4-16. Transfer and Exchange Opportunities (DWR Table 11)**

Source Transfer Agency	Transfer or Exchange	Short-Term	Proposed Quantities, af/yr	Long-Term	Proposed Quantities, af/yr
FID: Pumped percolated wastewater in exchange for surface water	Exchange	--	--	Long-Term	13,800
Total					13,800

**DEVELOPMENT OF DESALINATED WATER**

10631 (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Because the City is not located in a coastal area, seawater desalination is not applicable to the City. In addition, the groundwater that underlies the City is not brackish in nature and does not require desalination. However, the City could provide financial assistance to other purveyors in exchange for water supplies. Should the need for this type of exchange arise, the City may consider one of these options in the future. Table 4-17 provides a summary of the City’s opportunities for development of desalinated water supplies.

**Table 4-17. Opportunities for Desalinated Water (DWR Table 18)**

Sources of Water	Yield, af/yr	Start Date	Type of Use	Other
Ocean Water	Not applicable to the City of Fresno			
Brackish Ocean Water				
Brackish Groundwater				
Other (such as impaired groundwater)				
Other				

**WHOLESALE SUPPLIES**

10631 (k) Urban water suppliers that rely 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 of 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 does not rely upon a wholesale agency for a source of water; therefore, these wholesale supply provisions of the UWMP Act do not apply to the City. As such, Tables 19 through 22 of the DWR Guidebook, which deal with wholesale supplies, do not apply to the City and are not included in this UWMP.

**SUMMARY OF CURRENT AND PLANNED WATER SUPPLIES**

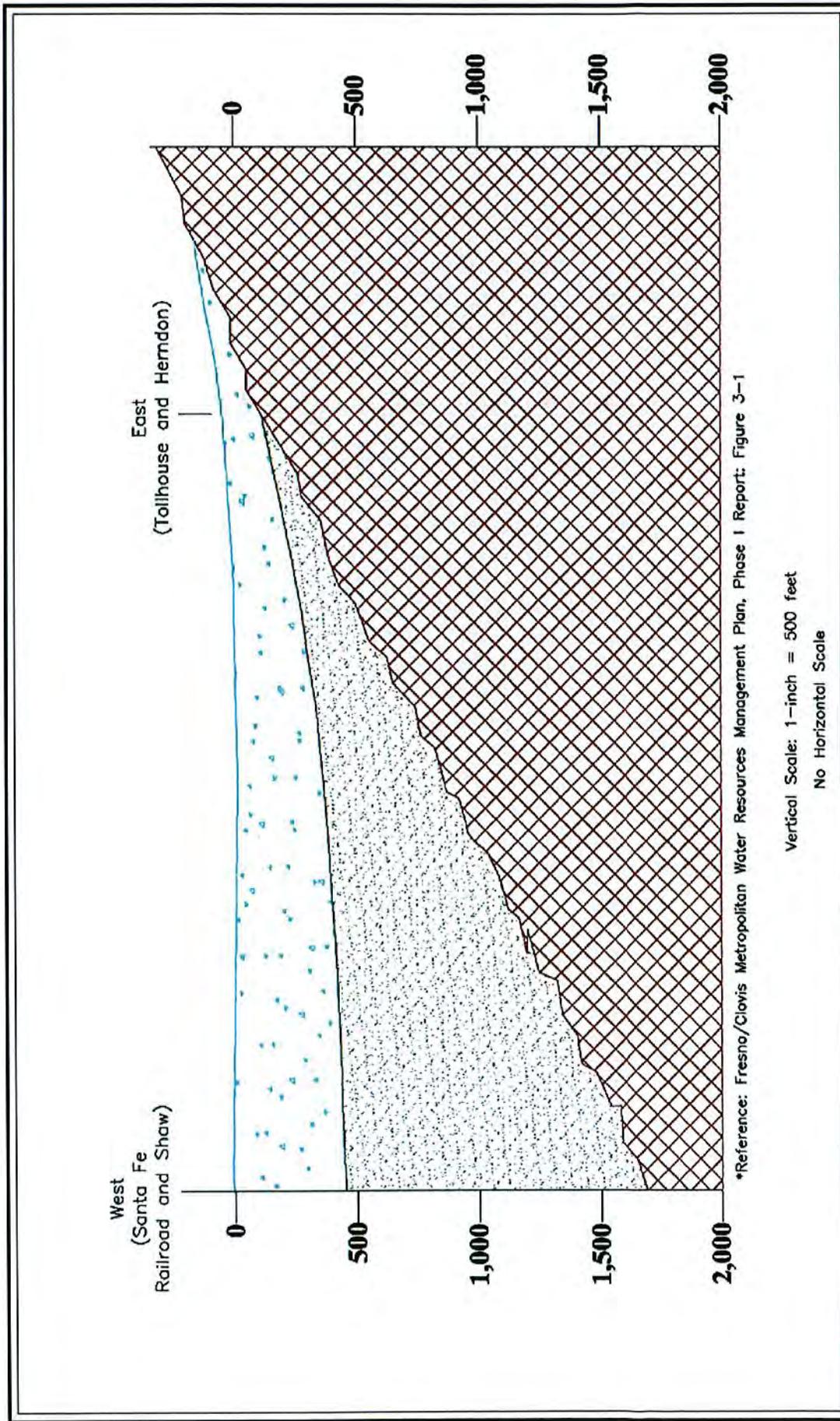
Table 4-18 provides a summary of the City’s current and planned water supplies to the year 2030, as presented previously in Tables 4-11, 4-12, and 4-14.

**Table 4-18. Current and Planned Water Supplies (DWR Table 4)**

Water Supply Sources	Current and Planned Water Supplies, af/yr					
	2005 (actual)	2010	2015	2020	2025	2030
Treated Surface Water (see Table 4-12)	15,807	30,800	92,500	123,400	123,400	123,400
Groundwater (see Table 4-11)	141,471	131,750	95,800	82,000	85,000	100,600
Transfers in or out	Not applicable to the City					
Exchanges in or out	See footnote <sup>(a)</sup>					
Recycled Water (see Table 4-14)		750	1,000	1,000	25,000	25,000
Desalination	Not applicable to the City					
<b>Total</b>	<b>157,278</b>	<b>163,300</b>	<b>189,300</b>	<b>206,400</b>	<b>233,400</b>	<b>249,000</b>

<sup>(a)</sup> As described above, the City’s recycled water exchange with FID is included in the City’s existing available surface water supplies and is therefore included under treated surface water.





**LEGEND**

-  Older Alluvium
-  Quaternary Deposits
-  Bedrock

**FIGURE 4-2**

City of Fresno  
 Urban Water Management Plan  
 IDEALIZED EAST-WEST  
 CROSS-SECTION



Figure 4-3. Groundwater Elevation Hydrographs for Selected City of Fresno Wells

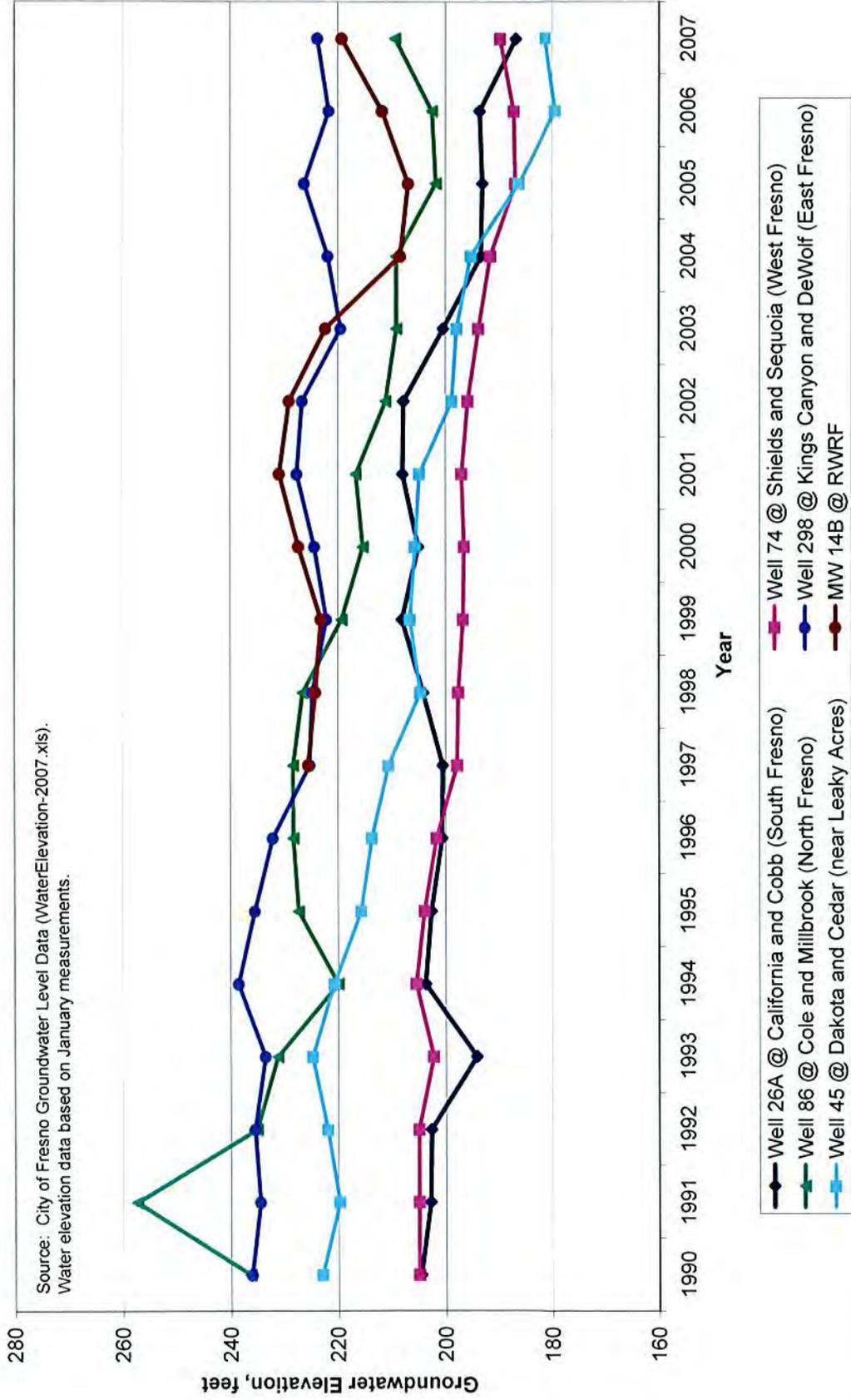
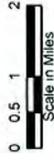


FIGURE 4-4

City of Fresno  
Urban Water  
Management Plan

SPRING 2006 GROUNDWATER  
ELEVATIONS IN THE  
UPPER AQUIFER ZONE  
(elevation above  
mean sea level)



NOTES:

- All data, including interpretation of groundwater elevation iso-contour lines provided by Schmidt & Associates.

LEGEND:

- City of Fresno Sphere of Influence
- Active City Well
- Monitoring Well
- Estimated Upper Zone Groundwater Elevation
- Upper Zone Groundwater Elevations
- Generalized Direction of Groundwater Flow

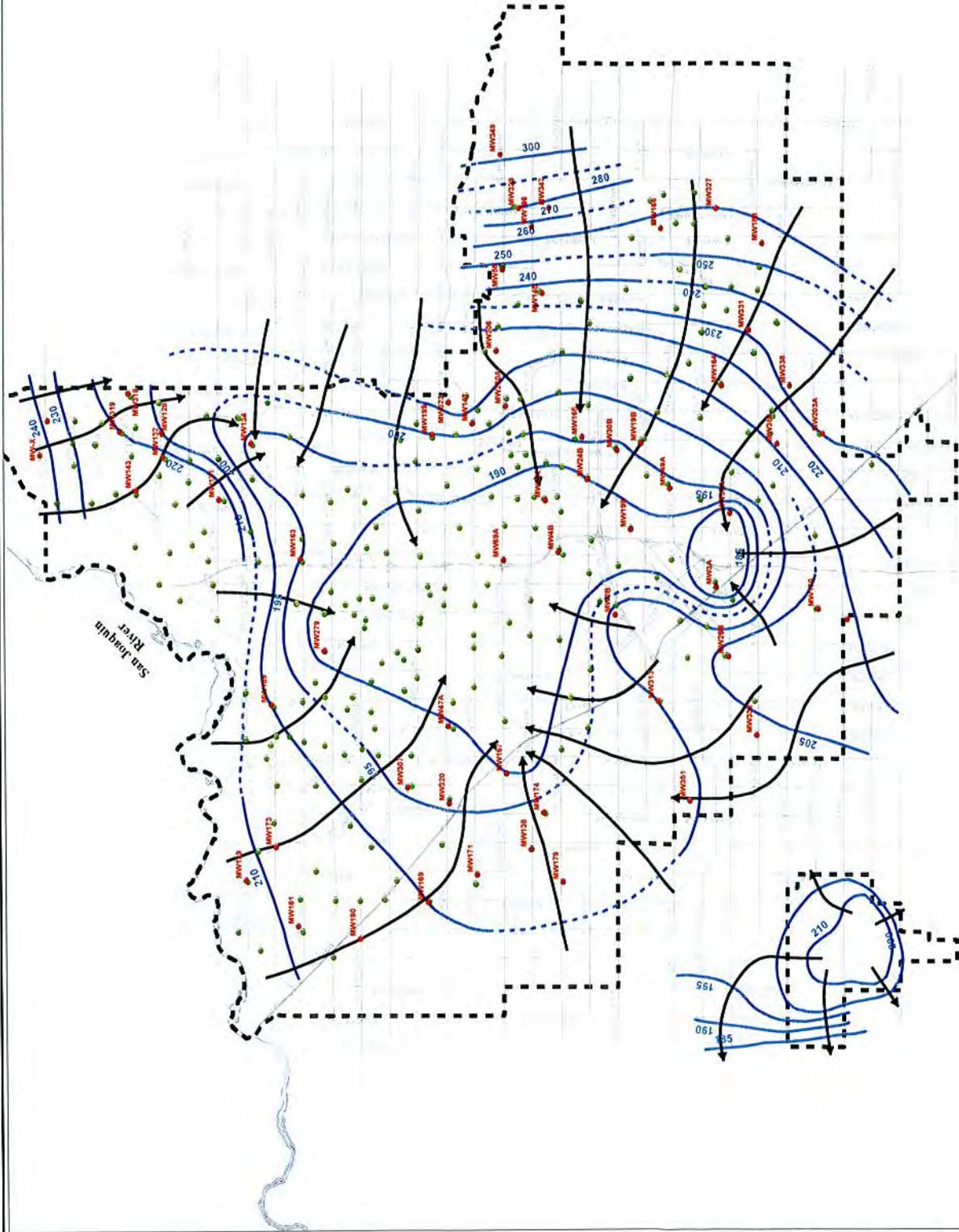
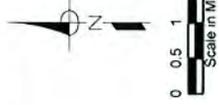


FIGURE 4-5

City of Fresno  
Urban Water  
Management Plan

SPRING 2006 GROUNDWATER  
ELEVATIONS IN THE  
LOWER AQUIFER ZONE  
(elevation above mean  
sea level)

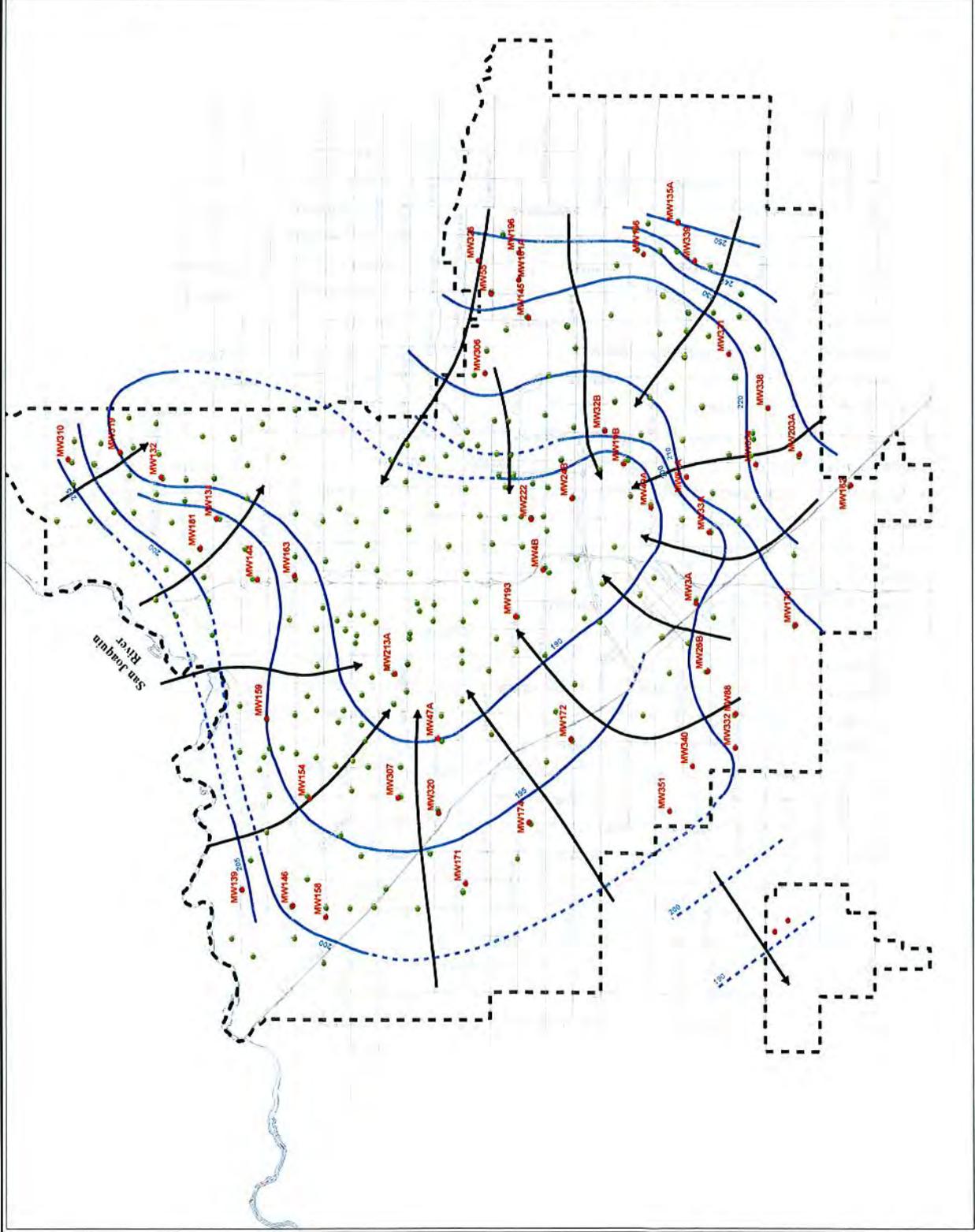


NOTES:

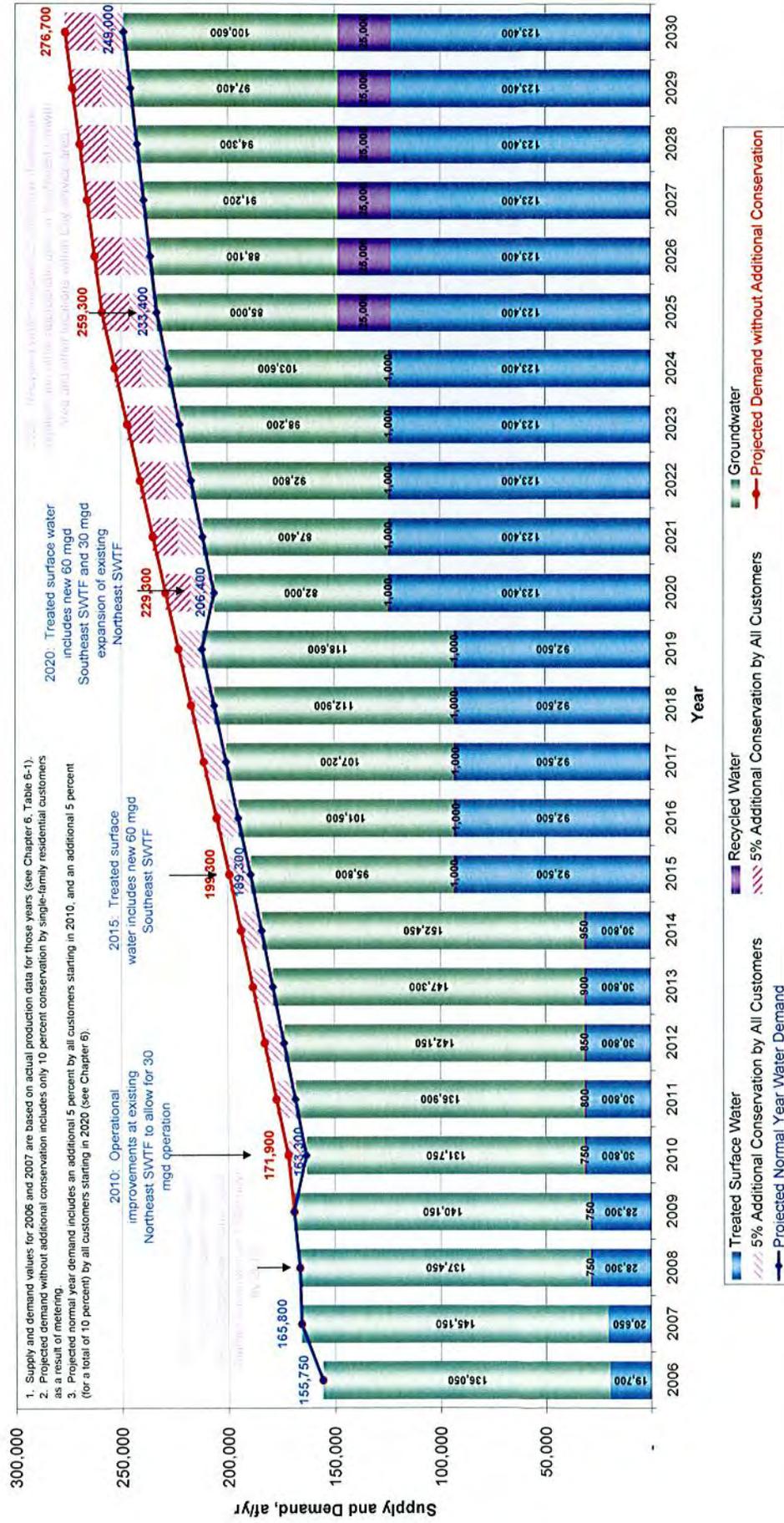
- All data, including interpretation of groundwater elevation iso-contour lines provided by Schmidt & Associates.

LEGEND:

- City of Fresno Spheres of Influence
- Active City Well
- Monitoring Well
- Estimated Lower Zone Groundwater Elevation
- Lower Zone Groundwater Elevation
- Generalized Direction of Groundwater Flow



**Figure 4-6. Projected Normal Year Annual Water Supply and Demand (2006 to 2030)**



## CHAPTER 5. WATER SUPPLY RELIABILITY

10631 (c) 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:

- (1) An average water year
- (2) A single-dry water year
- (3) Multiple-dry water years

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 possible.

### RELIABILITY OF SURFACE WATER SUPPLIES

In September 2006, the 2006 Settlement Agreement was filed in the U.S. District Court in Sacramento that ended an 18-year legal dispute over the operation of Friant Dam. The 2006 Settlement Agreement resolved legal claims brought by a coalition of conservation and fishing groups, which were led by the National Resources Defense Council (NRDC). The 2006 Settlement Agreement provides for substantial river channel improvements and sufficient water flow to sustain a salmon fishery upstream from the confluence of the Merced River tributary, while still providing water supply to the Friant Division of the CVP. As part of the 2006 Settlement Agreement, water year types were developed and simulated for the contracts in the Friant Division of the CVP. The water year types used in the Settlement Agreement included:

- Wet
- Normal-wet
- Normal-dry
- Dry
- Critical-high
- Critical-low

A normal year was assumed equal to the average of a Normal-wet and Normal-dry year for supply comparison purposes. Water year classification was used during this evaluation of supply reliability to help estimate the water supply expected to be available during various hydrologic conditions.

#### Reliability of Surface Water Supplies from the City's FID Contract

For the analysis of the reliability of surface water supplies from the City's FID contract, WYA used the 2006 Settlement Agreement as a proxy to help project Kings River availability during various hydrologic conditions because the KRWA does not provide this information; as noted in Chapter 4, KRWA determines the "pre-project" entitlements on a daily basis. KRWA further divides the entitlements into a portion delivered to the contracts and a portion stored in Pine Flat Reservoir. Using the defined Settlement Agreement conditions provided a common base from

which to compare the reliability of both supplies, while also allowing for better accounting for demand reductions during drier hydrologic periods.

Table 5-1 summarizes the average and proposed “applicable” diversions for FID, by hydrologic year classification based on available data from 1964 to 2002. This data is graphically shown on Figure 5-1. Because a Normal year was not defined in the 2006 Settlement Agreement, the Normal year diversion is estimated to be approximately 390,000 af (based on the weighted average of Normal-wet and Normal-dry years).

**Table 5-1. Available FID Diversion Quantity  
Based on the 2006 Settlement Agreement**

Water Year Classification	Total Diversion between 1964 and 2002 by Water Year Classification, af [1]	Number of Years within Water Year Classification [2]	Average Diversion by Water Year Classification, af <sup>(a)</sup> [3] = [1]/[2]	Proposed Diversion Quantity, for Water Supply Planning, af [4]
Wet	5,149,216	11	468,111	468,100
Normal-wet	3,839,518	9	426,613	426,600
Normal <sup>(b)</sup>	<b>Normal Year not defined in 2006 Settlement Agreement</b>			390,000
Normal-dry	3,571,299	10	357,130	357,100
Dry	2,244,530	7	320,647	320,600
Critical-high	232,257	1	232,257	232,200
Critical-low	202,300	1	202,300	202,300

<sup>(a)</sup> Average entitlement calculated by dividing the total entitlement by the number of years.

<sup>(b)</sup> Normal year assumed equal to the weighted average of Normal-wet and Normal-dry for this analysis.

The surface water available for the City to purchase, based on its 1976 agreement with FID, was determined by multiplying the percentage allocation (presented in Chapter 4, Table 4-2) by the adopted “applicable” diversion quantities summarized in Table 5-1. Table 5-2 presents the Kings River water available to the City, based on hydrologic water year classification defined by the 2006 Settlement Agreement.

**Table 5-2. FID Kings River Diversions Available to the City**

Classification	FID Kings River Diversions Available to the City <sup>(a)</sup> , af/yr					
	2005	2010	2015	2020	2025	2030
Wet	110,600	113,800	126,400	139,100	151,800	159,900
Normal-wet	100,800	103,700	115,200	126,800	138,400	145,800
Normal	92,200	94,800	105,400	115,900	126,500	133,300
Normal-dry	84,400	86,800	96,500	106,200	115,800	122,000
Dry	75,800	77,900	86,600	95,300	104,000	109,600
Critical-high	54,900	56,500	62,800	69,100	75,400	79,400
Critical-low	47,800	49,200	54,600	60,100	65,600	69,100

<sup>(a)</sup> Based on hydrologic year classification as defined by the 2006 Settlement Agreement.

**Reliability of Surface Water Supplies from the City’s USBR Contract**

Similar to the FID supplies, the reliability of the City’s USBR Class 1 water was also evaluated based on the 2006 Settlement Agreement. Table 5-3 summarizes the USBR water deliveries allocated to the City in the 2006 Settlement Agreement by hydrologic year classification based on simulated data from 1922 to 2003. This data is graphically shown on Figure 5-2. As mentioned previously, a Normal year is not defined in the 2006 Settlement Agreement; therefore, Normal year supplies were assumed equal to the weighted average supply during a Normal-wet and Normal-dry years.

**Table 5-3. Available USBR Entitlement Adopted from the 2006 Settlement Agreement**

Classification	Total Delivery between 1922 and 2003, af [1]	Number of Years within Classification [2]	Average Delivery, af <sup>(a)</sup> [3] = [1]/[2]	Adopted Diversion Quantity, for Water Supply Planning, af
Wet	959,600	16	60,000	60,000
Normal-wet	1,499,700	25	60,000	60,000
Normal	Normal Year not defined in 2006 Settlement Agreement			58,200
Normal-dry	1,349,700	24	56,200	56,200
Dry	477,900	12	39,800	39,200
Critical-high	100,700	4	25,200	25,200
Critical-low	13,900	1	13,900	13,900

<sup>(a)</sup> Data obtained from the 2006 Settlement Agreement.

<sup>(b)</sup> The entitlement available during a critical-low year was assumed equal to the entitlement delivered in 1977 to provide additional conservatism for planning purposes.

The projected surface water available for the City to purchase from the USBR during each hydrologic year defined by the 2006 Settlement Agreement is summarized in Table 5-4. As shown in Table 5-4, the projected water supply from the USBR, during each hydrologic year type, does not change in the future. Unlike the City’s contract with FID, the entitlement the City has with the USBR is not tied to growth of the City’s water service area.

**Table 5-4. USBR Entitlement Available to the City for Each Hydrologic Year Type**

Classification	USBR Entitlement Available to the City <sup>(a)</sup> , af/yr					
	2005	2010	2015	2020	2025	2030
Wet	60,000	60,000	60,000	60,000	60,000	60,000
Normal-wet	60,000	60,000	60,000	60,000	60,000	60,000
Normal	58,200	58,200	58,200	58,200	58,200	58,200
Normal-dry	56,200	56,200	56,200	56,200	56,200	56,200
Dry	39,200	39,200	39,200	39,200	39,200	39,200
Critical-high	25,200	25,200	25,200	25,200	25,200	25,200
Critical-low	13,900	13,900	13,900	13,900	13,900	13,900

<sup>(a)</sup> Based on available USBR entitlement adopted from the 2006 Settlement Agreement (see Table 5-3).

**Reliability of Surface Water Available through Recycled Water Activities**

Although total wastewater flows might be reduced slightly, recycled water is essentially 100 percent reliable even during drought events. This is because wastewater flows are primarily generated from indoor water uses which are not reduced significantly during drought conditions. Therefore, the City should be able to continue to percolate treated effluent near the wastewater treatment plant under all hydrologic conditions. Based on a 16-year record, the average annual quantity of treated wastewater percolated by the City is approximately 57,200 af per year. Therefore, there appears to be sufficient percolation to allow the City to continue to pump 30,000 afa of groundwater (maximum annual pumpage allowed) into the FID canals (assumes 10-year maximum of 100,000 af will be overlooked, as in the past).

Based on a 46 percent return from FID on the 30,000 afa of previously percolated, treated effluent that is pumped from the groundwater basins and provided to FID, the City should be able to obtain 13,800 afa of Kings River water from FID. For planning purposes, it was assumed that language in the City’s 1976 Agreements with FID regarding this issues that states “insofar as is feasible and practical...” implied that FID could supply up to 13,800 afa of surface water supply during all hydrologic conditions.

**Reliability of All Surface Water Supplies under Various Hydrologic Conditions**

Table 5-5 presents the total surface water available to the City under all hydrologic conditions based on the discussion provided above.

**Table 5-5. Surface Water Supply Available to the City Under All Hydrologic Conditions**

Classification	Surface Water Available to the City <sup>(a)</sup> , af/yr					
	2005	2010	2015	2020	2025	2030
Wet	184,400	187,600	200,200	212,900	225,600	233,700
Normal-wet	174,600	177,500	189,000	200,600	212,200	219,600
Normal	164,200	166,800	177,400	187,900	198,500	205,300
Normal-dry	154,400	156,800	166,500	176,200	185,800	192,000
Dry	128,800	130,900	139,600	148,300	157,000	162,600
Critical-high	93,900	95,500	101,800	108,100	114,400	118,400
Critical-low	75,500	76,900	82,300	87,800	93,300	96,800

<sup>(a)</sup> Includes surface water supplies from FID Kings River Diversions (see Table 5-2), USBR entitlement (see Table 5-4), and surface water available to the City based on the recycled water exchange agreement with FID (13,800 afa).

As described in Chapter 4, the City’s ability to use all of its available surface water supplies is limited by its current surface water treatment capacity and the capacity of its intentional recharge facilities. One of the primary objectives of the City’s future water supply plan is to maximize the use of its available surface water supplies either through treatment and direct use or intentional recharge.

As previously shown in Table 4-12, future surface water treatment capacity has been planned such that, under most hydrologic conditions, the surface water treatment facilities can continue to operate at full capacity. Only under critically dry conditions (either Critical-High or Critical-Low) would surface water supplies be limited such that the proposed surface water treatment facilities would not be able to operate at their full production capacities. For example, in 2030, the planned surface water treatment capacity is 123,400 af/yr. However, in 2030, under Critical-low conditions, only 96,800 af/yr of surface water is available. Therefore, in 2030, under Critical-low conditions, the surface water treatment facilities would only be able to operate at about 78 percent of their full capacities (96,800 af/yr divided by 123,400 af/yr). This reduction in treated surface water supply in critically dry years is discussed further in Chapter 7 of this UWMP.

**RELIABILITY OF GROUNDWATER SUPPLIES**

The City has relied on groundwater supplies since the City first began operating a water system in 1876. Over the years, the City’s groundwater operations have changed in response to changing conditions and regulations. In the future, groundwater will continue to be an important

component of the City’s water supply portfolio. The primary concerns with groundwater reliability are ability to pump the required supply using existing well facilities and the quality of the groundwater. One of the primary objectives of the City’s future water supply plan is to balance groundwater operations by 2025. This objective, to be achieved by increasing intentional recharge while reducing groundwater pumpage, and increasing surface water treatment facilities, will provide two benefits. Firstly, it will help to stabilize groundwater levels so that groundwater levels do not continue to decline. Secondly, it will help to mitigate the migration of contaminants within the basin and reduce the potential for additional quality issues that can occur as groundwater levels decline. Based on these operational changes, it is anticipated that the City’s future groundwater supply will be reliable.

**RELIABILITY OF RECYCLED WATER SUPPLIES**

As discussed above, although total wastewater flows might be reduced slightly, recycled water is essentially 100 percent reliable even during drought events. This is because wastewater flows are primarily generated from indoor water uses which are not reduced significantly during drought conditions. Therefore, it is anticipated that the City should be able to continue to produce and deliver recycled water as planned in the City’s future water supply plan under all hydrologic conditions.

**SUMMARY OF OVERALL WATER SUPPLY RELIABILITY**

Table 5-6 presents a summary of the City’s overall water supply reliability under various hydrologic conditions. As shown in Table 5-6, single dry years are assumed to have Critical-low supply conditions (corresponding to the Critical-low classification defined in the 2006 Settlement Agreement). Multiple dry years are assumed to be Normal-dry for the first two years, Dry for the third and fourth years, and Critical-low for the fifth year.

**Table 5-6. Overall Supply Reliability (DWR Table 8)**

Supply Source	Normal Water Year, af/yr	Single Dry Water Year, af/yr	Multiple Dry Water Years, af/yr				
			Year 1	Year 2	Year 3	Year 4	Year 5
Assumed Hydrologic Water Year Condition <sup>(a)</sup>	Normal	Critical-low	Normal-dry	Normal-dry	Dry	Dry	Critical-low
Groundwater	100%	100%	100%	100%	100%	100%	100%
Treated Surface Water <sup>(b)</sup>	100%	71-100%	100%	100%	100%	100%	71-100%
Recycled Water	100%	100%	100%	100%	100%	100%	100%

<sup>(a)</sup> Based on the hydrologic year classifications provided in the 2006 Settlement Agreement. See Table 5-7 for basis of water year data.

<sup>(b)</sup> Reliability of treated surface water is reduced in critically dry years based on projected availability of surface water supplies. Reliability ranges from 71 to 100 percent depending on the year and the surface water treatment capacity available in that year.

Table 5-7 shows the basis of the water year data used to determine supply reliability. As previously shown in Figure 5-2, recent years, including 1999 to 2003, had Normal-wet or Normal-dry conditions; therefore, for purposes of this 2008 UWMP, 2003 is considered to be representative of a recent Normal water year. As previously shown in Figures 5-1 and 5-2, Critical-low supply conditions occurred in 1977. For purposes of this 2008 UWMP, 1977 is therefore assumed to be representative of the Single-Dry Water Year condition. The worst multiple-dry year sequence occurred in the six-year period from 1987 to 1992. Individual years within this six-year period were either Dry or Normal-dry. As shown above in Table 5-6, for the purposes of this 2008 UWMP, it has been assumed that the five-year multiple dry year sequence will have two Normal-dry years, followed by two Dry years and one Critical-low year. Because it includes a Critical-low year, this assumed five-year multiple-dry year period is thus somewhat drier than the historical multiple-dry year period.

**Table 5-7. Basis of Water Year Data (DWR Table 9)**

Water Year Type	Base Year(s)	Historical Sequence
Normal Water Year	2003 (Normal-wet)	One year: 2003
Single-Dry Water Year	1977 (Critical-low as defined by 2006 Settlement Agreement)	One year: 1977
Multiple-Dry Water Years	1987-1992 (Dry and Normal-dry as defined by 2006 Settlement Agreement)	Six-years: 1987-1992

Several factors can affect a supply sources reliability and consistency. As discussed above, the City’s surface water supply from FID and USBR is subject to contractual conditions and potential reductions due to dry year conditions. The City’s recycled water exchange with FID is also subject to institutional constraints per the City’s agreement with FID. The City’s groundwater supplies, although considered very reliable, do have water quality concerns, requiring the City to provide wellhead treatment on many of its wells. Recycled water, although highly regulated in its use, is considered to be a very reliable and consistent source of supply. Table 5-8 provides a summary of the potential factors which could result in supply inconsistency.

**Table 5-8. Factors Resulting in Inconsistency of Supply (DWR Table 10)**

Supply Source	Institutional/ Contractual	Legal	Environmental	Water Quality	Climatic
Surface Water from FID	✓				✓
Surface Water from USBR	✓				✓
Surface Water from Recycled Water Exchange	✓				
Groundwater				✓	
Recycled Water					

### WATER QUALITY IMPACTS ON RELIABILITY

*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.*

#### Surface Water

Federal and state water quality regulations related to surface water treatment are subject to on-going and future review and revision. The City’s existing and future SWTFs are and will continue to be operated to meet all applicable water quality regulations. If required, modifications will be made to treatment operations to ensure compliance with applicable regulations. Therefore, it is not anticipated that future changes in surface water quality or surface water quality regulations will impact the availability or reliability of surface water supplies in the future.

#### Groundwater

Federal and state water quality regulations related to groundwater quality are subject to on-going and future review and revision. In addition, as described in Chapter 4, the groundwater basin underlying the City is subject to several chemical contaminants which have either rendered wells unusable or have required the installation of wellhead treatment systems. The City has received several legal settlements from a number of lawsuits related to groundwater contamination which has provided for the construction and on-going operation of many of these wellhead treatment systems. In the future, groundwater regulations may change or existing contaminants may migrate, requiring the construction of additional wellhead treatment systems. Planning for this potential additional wellhead treatment has been included in the City’s future water supply plan. Overall, the City’s future water supply plan includes reducing groundwater pumpage by the City, so as not to cause additional water quality degradation through increased pumpage. Therefore, it is not anticipated that future changes in groundwater quality or groundwater quality regulations

will impact the availability or reliability of groundwater supplies in the future, beyond what has already been planned for.

**Recycled Water**

Federal and state water quality regulations related to recycled water are subject to on-going and future review and revision. The City's existing and future wastewater treatment facilities (RWRP, North Fresno WRF and other future facilities) are and will continue to be operated to meet all applicable water quality regulations. If required, modifications will be made to treatment operations to ensure compliance with applicable regulations. Therefore, it is not anticipated that future changes in recycled water quality or recycled water quality regulations will impact the availability or reliability of recycled water supplies in the future.

Table 5-9 indicates that there are no projected water supply changes due to water quality issues.

**Table 5-9. Current and Projected Water Supply Changes Due to Water Quality  
(DWR Table 39)**

Supply Source	2005	2010	2015	2020	2025	2030
Surface Water	No water supply changes due to water quality anticipated					
Groundwater						
Recycled Water						

**Figure 5-1. FID Kings River Water Applicable to City's Agreement**

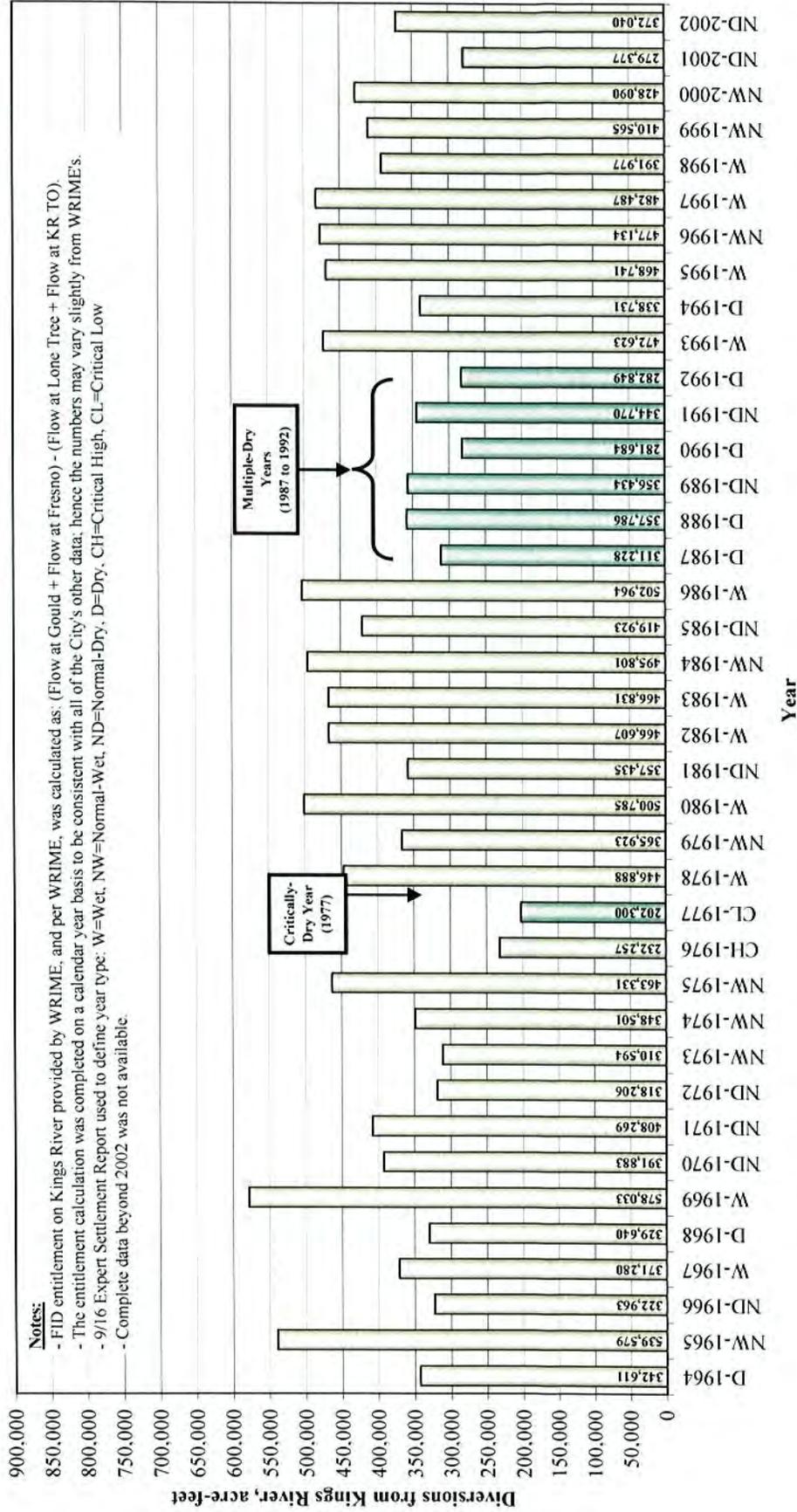
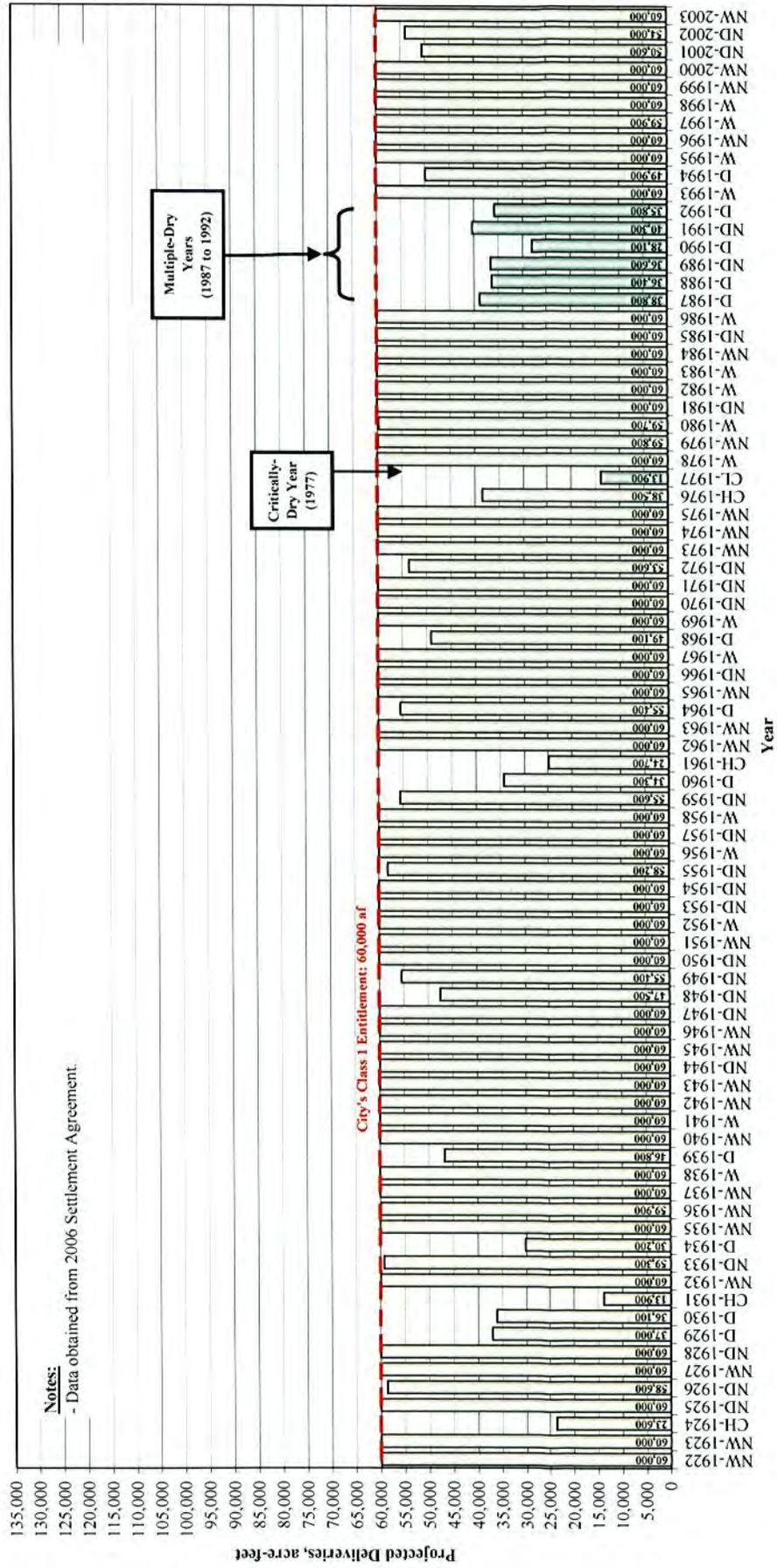


Figure 5-2. Bureau Deliveries to the City of Fresno Adopted from the 2006 Settlement Agreement



## CHAPTER 6. WATER DEMAND

This chapter describes the following:

- Historical Water Production and Consumption
- Future Demand Projections
- Projected Urban Water Demands
- Sales to Other Agencies
- Additional Water Uses and Losses
- Total Water Use

### HISTORICAL WATER PRODUCTION AND CONSUMPTION

Water production is the combined quantity of water produced by the City's groundwater wells and City's Surface Water Treatment Facility (SWTF), while water consumption is the quantity of water actually consumed or used. As will be discussed later, the difference between production and consumption is unaccounted-for water (UAFW).

The City currently tracks all of the water produced by its wells and the SWTF, which was completed in 2004. Although the City does not currently meter Single Family Residences, it does meter the consumption for its other customers: Multiple Family Residential, Commercial/Institutional, Industrial, and Landscape Irrigation. As discussed in Chapter 8, the City will be implementing a residential metering program for its single-family residential customers beginning in 2008 (see also Appendix I).

Consequently, the City tracks water use in two ways: water production records and meter (consumption) records. Both are discussed in more detail below, along with a discussion on UAFW.

#### Historical Water Production Records

The City currently meets its water demands using a combination of City-owned groundwater wells and treated surface water supplied from its SWTF. Table 6-1 presents the City's historical water production between 1990 and 2007 from all of its water supply sources.

**Table 6-1. Historical Water Production**

Calendar Year	Groundwater, af	Treated Surface Water, af	Total Production, af	Percent Groundwater	Percent Surface Water
1990	118,808	0	118,808	100%	0%
1991	117,562	0	117,562	100%	0%
1992	118,303	0	118,303	100%	0%
1993	119,521	0	119,521	100%	0%
1994	128,992	0	128,992	100%	0%
1995	130,389	0	130,389	100%	0%
1996	138,389	0	138,389	100%	0%
1997	148,670	0	148,670	100%	0%
1998	135,546	0	135,546	100%	0%
1999	151,806	0	151,806	100%	0%
2000	156,487	0	156,487	100%	0%
2001	164,049	0	164,049	100%	0%
2002	165,542	0	165,542	100%	0%
2003	165,177	0	165,177	100%	0%
2004	160,047	4,060	164,108	98%	2%
2005	141,471	15,807	157,278	90%	10%
2006	136,050	19,701	155,750	87%	13%
2007	145,148	20,650	165,798	88%	12%

As shown in Table 6-1, the City’s water production has increased from approximately 118,808 acre-feet (af) in 1990 to 165,798 af in 2007, representing a 40 percent increase over the last 17 years. The City’s Surface Water Treatment Facility came online in late 2004, and in 2007, the City was able to offset its groundwater use by approximately 12 percent by using the new Surface Water Treatment Facility throughout the year.

**Per Capita Water Use**

Historical Per Capita Water Use

Based on the estimated historical population served by the City from 1989 to 2007, historical per capita water production has been estimated and is illustrated on Figure 6-1. As shown in Figure 6-1, from 1989 to 2007, total per capita water production has varied from a low of 269 gallons per capita per day (gpcd) in 1993 to a high of 332 gpcd in 2001. In 2007, the total per capita water production was estimated to be 300 gpcd. The average total per capita water production was 300 gpcd from 1989 to 2007.

The City does not currently meter single-family residential water use. However, water uses by other customer classes are metered. Therefore, the total water use by single-family residential users can be estimated by subtracting all metered water use and estimated unaccounted for water (assumed to be 10 percent, see below) from the total water production. Using this methodology, it was determined that single-family residential water use ranged from 241 to 298 gpcd from 1998 to 2007, and averaged about 271 gpcd over the same period. Figure 6-1 shows the estimated single-family residential per capita water consumption from 1998 to 2007, based on historical water consumption.

Projected Future Per Capita Water Use

For projecting future demands, WYA has assumed that the baseline per capita water use (before residential metering is considered) will be equal to the average per capita water demand for the last nineteen years (1989 to 2007), or 300 gpcd. For purposes of projecting future water demands based on per capita water use, it has been assumed that beginning in 2009, single-family residential per capita water use will decrease by 2 percent per year for five years, for a total reduction of 10 percent by 2013 (to about 270 gpcd), to reflect the City’s single-family residential water metering program.

As described in Chapter 4, additional water conservation will be an important part of the City’s future water supply plan. To further decrease the overall per capita water use, additional water conservation measures are recommended as part of the City’s future water supply plan. An additional 5 percent overall conservation by all customers is recommended starting in 2010 (to reduce the per capita water use to 257 gpcd once all of the reductions due to residential metering are achieved), and an additional 5 percent (10 percent total) by all customers is recommended starting in 2020 (to reduce the per capita water use to 243 gpcd).

Based on these assumptions, the current total per capita water consumption will be reduced by about 20 percent by 2020, to a total per capita water use of about 243 gpcd. This projected reduction in per capita water use is summarized in Table 6-2 and shown on Figure 6-2.

**Table 6-2. Reduction in Per Capita Water Demand as a Result of Additional Water Conservation**

	2010	2015	2020	2025	2030
Current Per Capita Water Use (without residential water metering or additional conservation), gpcd	300	300	300	300	300
Projected Per Capita Water Use as a result of residential water metering (about 2 percent per year for five years starting in 2009), gpcd	288	270	270	270	270
Projected Per Capita Water Use as a result of 5 percent conservation by all customers starting in 2010, gpcd	274	257	257	257	257
Projected Per Capita Water Use as a result of 5 percent additional conservation by all customers starting in 2020, gpcd	--	--	243	243	243
Resulting Per Capita Water Use, gpcd	274	257	243	243	243

### **Unaccounted-For Water**

The City's UAFW is the difference between the recorded water production and metered consumption; however, because the City does not meter its Single Family Residential customer class, the UAFW could not be specifically determined.

UAFW includes many uses, such as hydrant flushing/testing, construction, fire fighting, system leaks, and water main breaks. A city with the infrastructure age of Fresno likely has an UAFW rate of 10 percent or higher, depending on the condition of older pipelines in the system. For planning purposes in this UWMP, UAFW for the City's water system was assumed equal to 10 percent.

### **Historical Water Consumption**

Historical water consumption for the City's water service area for 1995 through 2007 is shown on Table 6-3. As discussed above, the City does not currently meter single-family residential customers. However, the City does meter other customer classes, including multi-family residential, commercial/institutional, industrial, and landscape irrigation. Therefore, historical water consumption by single-family residential customers was estimated by WYA by subtracting all metered water use and estimated UAFW (assumed to be 10 percent of total water production) from the City's total water production.

In 2007, water use by single-family residential customers was estimated to be approximately 85,285 af, accounting for about 51 percent of the City's total water use, while multi-family residential was 23,529 af (14 percent), commercial/institutional was 24,554 af (15 percent), industrial was 6,334 af (4 percent), and landscape irrigation was 8,955 af (5 percent). Unaccounted for water was assumed to be 10 percent of total water production, or 16,580 af. As shown in Table 6-3, single-family residential water use decreased from 2003 to 2006, but then increased again in 2007. The initial decrease may have been a result of the City's water conservation efforts over the last several years (a check of the annual rainfall indicates that the City received about its historical annual average rainfall quantities over the past few years). Overall, water use in the City service area decreased since 2002, but then appears to have increased in 2007 (possibly due to dry conditions in 2007).

## **FUTURE DEMAND PROJECTIONS**

### **Per Capita Based Potable Demand Projections**

Based on the projected population of the City's water service area and the projected future per capita water use (assuming additional water conservation savings by all customers, and the metering of all single-family residential customers), per capita based potable water demand projections have been made for the City's water service area. Using the City Water Division service area population estimates with a 1.9 percent annual population increase (considered to be the "Low Population" estimate), the projected potable water demand in 2025 is estimated to be approximately 209,400 af. Using the population estimates from the City's 2025 General Plan (considered to be the "High Population" estimate), the projected potable water demand in 2025 is 239,200 af. The per capita based water use projections are shown in Figure 6-3.



## Land Use Based Potable Demand Projections

In addition to per capita based potable demand projections, future water demands for the City were also calculated using land use acreage and unit demand factors to develop future water demand projections by customer class. Subsequent sections describe the methodology used to develop unit demand factors by customer type, project water demands, and then compare the land use based demand projections to the per capita based demand projections.

Potable water demands were projected for the City by multiplying the unit demand factors developed for the City's Metro Plan Update Phase 1 Report by the projected future land use acres within the City's service area. Table 6-4 presents the projected water demands, by customer class, for years 2005, 2010, and 2025 using land use based unit demand factors. Projected water use or consumption presented in Table 6-4 accounts for metering of Single Family Residential connections, while projected water production includes UAFW at 10 percent.

As shown in Table 6-4, the City's projected water production in 2005 was approximately 157,600 af, while the actual production was 157,278 af (see Table 6-1), verifying the validity and accuracy of this methodology.

Table 6-4 also indicates that the City's lower water production needs (corresponding to the lower service population estimate) will increase from approximately 157,600 af in 2005 to 248,800 af in 2025 (buildout of the General Plan), or approximately 58 percent over the next 20 years. However, the City's water production need could also increase by approximately 55 percent (from 167,400 to 259,300 af) should the water supply contingency set aside for the Bakman, CSUF, Pinedale, and private groundwater users be requested (i.e., Bakman, CSUF, Pinedale, and private groundwater users request City service).

Figure 6-4 illustrates the City's low and high water production needs over the next 20 years using interpolation between 2005 and 2010, and between 2010 and 2025. As shown in Figure 6-4, the City's projected water demands can vary by approximately 10,000 af, depending on whether portions of the SOI currently served by others are served by the City in the future.

## Comparison of Per Capita and Land Use Based Demand Projections

Figure 6-5 compares per capita demand projections to land use based demand projections. The low per capita based demand estimate in 2025 is likely the result of assumed growth rates associated with future population projections, and not exercising the water supply contingency set aside for Pinedale, Bakman, CSUF, and other private users to the City system. However, the per capita and land use based demand projections are sufficiently close for planning purposes in this UWMP.

Typically, per capita based water demand projections uniformly distribute water use over the entire service area and, therefore, do not account for specific land uses and locations. Additionally, per capita based water demand projections do not accurately account for changes in type of water demand over time (e.g., residential and commercial). Consequently, this UWMP will use land use based demand projections for planning future water supply needs.

Table 6-4. Land Use Based Demand Projections by Customer Class (with recent conservation and future metering)<sup>(a)</sup>

Customer Class	Unit Factors, af/ac/yr			Low Demand Estimate						High Demand Estimate					
	2005		2010	2005 (estimated)		2010		2025 (Buildout of GP)		2005 (estimated)		2010		2025 (Buildout of GP)	
	2005	2010	2025	Area, acres	Water Demand, af/yr	Area, acres	Water Demand, af/yr	Area, acres	Water Demand, af/yr	Area, acres	Water Demand, af/yr	Area, acres	Water Demand, af/yr	Area, acres	Water Demand, af/yr
Single Family Residential	3.8	3.5	3.2	21,948	83,400	25,619	89,700	36,244	116,000	22,777	86,600	26,688	93,400	37,414	119,700
Multi-Family Residential	6.5	6.2	6.2	3,475	22,600	3,757	23,300	4,639	28,800	3,852	25,000	4,133	25,600	4,981	30,900
Commercial/Institutional	2.0	1.9	1.9	12,449	24,900	12,771	24,300	19,339	36,700	14,084	28,200	14,563	27,700	21,273	40,400
Industrial	2.0	1.9	1.9	1,994	4,000	1,994	3,800	4,098	7,800	1,994	4,000	1,994	3,800	4,098	7,800
Landscape Irrigation	3.0	2.9	2.9	2,304	6,900	2,376	6,900	2,675	7,800	2,310	6,900	2,391	6,900	2,705	7,800
South East Growth Area	3.4	3.2	3.2	0	0	2,094	6,700	8,376	26,800	0	0	2,094	6,700	8,376	26,800
Total Projected Consumption					141,800		154,700		223,900		150,700		164,100		233,400
UAFW (10%)					15,800		17,200		24,900		16,700		18,200		25,900
Total Projected Production					157,600		171,900		248,800		167,400		182,300		259,300

<sup>(a)</sup> Demands do not account for recycled water supplies

## ADDITIONAL WATER CONSERVATION

One of the components of the City's future water supply plan (discussed in Chapter 4) is additional water conservation. Together with additional future water supplies, additional water conservation will serve to reduce future projected water demands such that the use of available supplies can be optimized. The future supply plan through the year 2030 includes additional water conservation at two levels: an additional 5 percent and an additional 10 percent. The additional 5 percent savings is assumed for the 2010 and 2015 planning horizons, while the additional 10 percent savings (an additional 5 percent savings over that assumed for 2010 and 2015) is assumed for the 2020, 2025, and 2030 planning horizons.

As described above, the City's projected future demand already incorporates the planned residential metering program, for which an additional 10 percent of conservation was assumed for the City's single-family residential customers. Based on these assumptions, the overall future water use was assumed to equate to about 270 gpcd. With an additional 5 percent conservation for 2010 and 2015, the City's overall water use would be reduced to about 257 gpcd. With an additional 10 percent conservation, the City's overall water use would be reduced to about 243 gpcd for 2020, 2025, and 2030. These reductions in per capita water use are shown in Table 6-2 and Figure 6-2.

Chapter 8 describes the City's current water conservation programs, in addition to some of the future programs that the City is considering for future implementation. In order to achieve the additional conservation included in the City's future water supply plan, the City and its customers will need to work together to conserve water.

## PROJECTED URBAN WATER DEMANDS

*10631 (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) Multi-family*
- (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.*

*(2) Agricultural*

*(3) The water use projections shall be in the same five-year increments described in subdivision (a)*

As discussed above, this 2008 UWMP uses land use based demand projections. For planning purposes, it was assumed that future water demands would follow the low land use based demand estimate until 2013 (when the residential water metering program is scheduled to be completed), then incrementally transition to the high land use based estimate by 2025.

Figure 6-6 presents the recommended water demand projection for the City (with and without the additional water conservation as described above). As shown in Figure 6-6, the City's demands (including unaccounted for water but not including additional conservation) are projected to increase from 157,600 af/yr in 2005 to 276,700 af/yr by the year 2030; representing a 76 percent increase in water demands over the next 25 years. Assuming the 10 percent additional conservation by 2030, water demands would only increase to 249,000 af/yr by 2030, representing a 58 percent increase over the next 25 years.

Table 6-5 shows the projected water demands by land use designation through the year 2030. Table 6-6 provides a breakdown of the projected water demands by land use designation, and by metered and unmetered connections, through the year 2030. As shown, for 2010, it has been assumed that 40 percent of the single family residential connections are metered. By 2013, it has been assumed that 100 percent of the single family residential connections are metered.

**Table 6-5. Projected Urban Water Demands through the Year 2030**

Year	Projected Water Demands, af/yr						
	2000 (Actual)	2005 (Actual)	2010	2015	2020	2025	2030 <sup>(a)</sup>
Urban Demand <sup>(b)</sup>	140,900	141,800	154,700	179,400	206,400	233,400	249,000
UAFW <sup>(c)</sup> (see discussion below)	15,700	15,800	17,200	19,900	22,900	25,900	27,700
Total Demand (including UAFW)	156,600	157,600	171,900	199,300	229,300	259,300	276,700
Additional Water Conservation, %	--	--	5%	5%	10%	10%	10%
Reduced Urban Demand	140,900	141,800	147,000	170,400	185,800	210,100	224,100
UAFW <sup>(c)</sup> (see discussion below)	15,700	15,800	16,300	18,900	20,600	23,300	24,900
Total Demand (with Additional Conservation) (including UAFW)	156,600	157,600	163,300	189,300	206,400	233,400	249,000

(a) Year 2030 water demand projection based on interpolation of demand projections in 2025 and 2060 per Metro Plan Update Phase I Report dated December 2007.

(b) Does not include unaccounted for water (see Table 6-7).

(c) Assumed to be 10 percent of water production.

Table 6-4. Past, Current, and Projected Water Deliveries (DWR Table 12)

Year	Metered vs. Unmetered	Water Use Sector		Single Family		Multi-Family		Southwest Growth Area	Commercial/Institutional	Industrial	Landscape Irrigation	Fire Protection	Total Accounts	Without Additional Conservation		With Additional Conservation		Reduced Total Demand including Estimated UAFW, af/y <sup>1)</sup>
		# of accounts	Deliveries, af/y <sup>2)</sup>	Market Value	Lower Income <sup>3)</sup>	Market Value	Lower Income <sup>3)</sup>							Total Deliveries, af/y <sup>2)</sup>	Total Demand including Estimated UAFW, af/y <sup>2)</sup>	Assumed Additional Conservation, percent	Reduced Deliveries including Additional Conservation, af/y <sup>2)</sup>	
2000	Metered	103,506	137,826	6,991	425	20,427	1,373	-	7,416	1186	1,516	395	16,759	55,000	140,900	156,600	140,900	156,600
	Unmetered	83,409	2,491	-	-	-	-	-	24,800	4,100	4,600	-	98,150	85,900	-	-	-	-
2005	Metered	103,506	142,424	7,088	436	21,176	1,424	-	7,892	4,091	2,343	2,568	20,313	58,400	141,800	157,600	141,800	157,600
	Unmetered	80,981	2,419	-	-	-	-	-	24,900	4,091	6,981	-	103,513	83,400	-	-	-	-
2010 <sup>4)</sup>	Metered	88,329	1,041	7,663	472	21,832	1,468	9,876	8,086	3,801	2,315	2,960	79,796	100,880	154,700	171,900	147,000	163,300
	Unmetered	72,491	5	-	-	-	-	6,700	24,300	3,801	6,980	-	72,496	53,820	-	-	-	-
2015 <sup>5)</sup>	Metered	137,820	16	8,262	599	25,987	1,613	19,752	9,472	130	2,410	3,505	181,568	179,400	179,400	199,500	170,400	189,300
	Unmetered	96,032	2,868	-	-	-	-	13,300	29,400	5,100	7,100	-	181,568	179,400	-	-	-	-
2020	Metered	154,223	11	8,862	526	26,517	1,783	20,624	10,838	164	3,507	4,047	210,844	206,400	206,400	229,500	186,600	206,400
	Unmetered	106,130	3,190	-	-	-	-	20,000	34,900	6,400	7,500	-	210,844	206,400	-	-	-	-
2025	Metered	170,925	12	9,462	563	28,953	1,947	39,804	12,244	197	2,604	4,591	240,121	233,400	233,400	259,300	210,100	233,400
	Unmetered	116,219	3,471	-	-	-	-	26,800	40,400	7,800	7,800	-	240,121	233,400	-	-	-	-
2030	Metered	187,627	13	10,081	619	30,078	2,022	49,379	13,631	251	3,201	5,133	269,397	249,000	249,000	276,700	224,100	249,000
	Unmetered	130,695	3,605	-	-	-	-	32,100	45,900	8,800	7,800	-	269,397	249,000	-	-	-	-

<sup>1)</sup> Based on estimated percentage of lower income single family dwelling units = 0.007 percent.  
<sup>2)</sup> Based on estimated percentage of lower income multi family dwelling units = 5.8 percent.  
<sup>3)</sup> Does not include unmetered for water.  
<sup>4)</sup> Assumes 40 percent of the single family residential connections are metered by 2010.  
<sup>5)</sup> Assumes 100 percent of the single family residential connections are metered by 2015.

**SALES TO OTHER AGENCIES**

As described in Chapter 8, the City serves a small portion of the Pinedale County Water District (about 28 service connections in the portion east of Highway 41) and a small County area known as the Berans Tract (via two service connections). As shown in Table 6-7, the quantities of potable water sold to these agencies are quite small, constituting less than 0.1 percent of the City’s total water production. These quantities are anticipated to remain essentially the same into the future, therefore, the future projected water sales are based on the average water sales to each agency over the last 10 years.

**Table 6-7. Water Sales to Other Agencies (DWR Table 13)**

Agencies	Water Sales to Other Agencies, af/yr						
	2000 (Actual)	2005 (Actual)	2010	2015	2020	2025	2030
Pinedale County Water District (portion east of Highway 41) <sup>(a)</sup>	27	27	27	27	27	27	27
Berans Tract	102 <sup>(b)</sup>	87 <sup>(c)</sup>	98 <sup>(d)</sup>	98	98	98	98
<b>Total</b>	<b>129</b>	<b>114</b>	<b>125</b>	<b>125</b>	<b>125</b>	<b>125</b>	<b>125</b>

Only two of the 28 connections served are metered. The other 26 connections are billed on a monthly flat rate.

Estimated water use is 27 af/yr (300 gpcd for 2.9 people per connection for 28 connections).

(d) Based on HTE Revenue Report. Data shown for FY00 ending 06/30/00.

(e) Based on HTE Revenue Report. Data shown for FY05 ending 06/30/05.

(f) Based on HTE Revenue Report average for FY98 to FY07.

The City tracks these water sales to other agencies as part of its overall water consumption. Therefore, the consumption numbers shown in Table 6-7 are included in the past, current, and projected water deliveries shown previously in Table 6-6.

**ADDITIONAL WATER USES AND LOSSES**

**Groundwater Recharge**

The City has an extensive groundwater recharge program to replenish the groundwater basin. In addition to sending treated wastewater effluent to percolation ponds (discussed further in Chapter 10 Recycled Water), the City is currently intentionally recharging the groundwater basin with surface water using numerous recharge facilities within its service area (including Leaky Acres, Woodward Park, Chestnut Basin<sup>1</sup>, FMFCD basins, and several local creeks and rivers). This intentional groundwater recharge totaled about 38,100 af in 2007, and has averaged about 44,200 af/yr over the last 23 years. The maximum intentional recharge occurred in 2003, when approximately 62,000 af of surface water was recharged to the groundwater basin. From 2000 to 2006, intentional recharge averaged about 51,200 af/yr. The ability to operate these recharge

<sup>1</sup> The Chestnut Basin is a joint venture basin between the City and FID.

operations depends on a number of factors, including pond availability, limited water delivery season, pond maintenance, or long wet seasons. Also, many of the FMFCD basins are dual-use basins, serving both flood control and recreational purposes. For the purposes of this UWMP, it has been assumed that intentional groundwater recharge will increase in the future to help balance future groundwater operations, wherein groundwater recharge equals groundwater pumpage, by 2025.

**Other Water Uses**

As discussed above, the City’s current and future expanded intentional groundwater recharge program will allow the City to balance future groundwater operations. This balanced groundwater operation will, in turn, allow the City to conjunctively use available surface water supplies together with its groundwater supplies.

If surplus surface water supplies are available, they will be used for additional intentional recharge and/or groundwater banking.

The City has not and currently does not plan to utilize water for other uses such as saline water intrusion barriers or agricultural uses.

**Unaccounted-For System Losses**

Estimates of the City’s unaccounted-for water (UAFW) are discussed above. Unaccounted-for water is currently estimated to be 10 percent of the City’s total water production.

Table 6-8 provides a summary of the City’s additional water uses and losses.

**Table 6-8. Additional Water Uses and Losses (DWR Table 14)**

Water Use	Additional Water Uses and Losses, af/yr						
	2000 (Actual)	2005 (Actual)	2010	2015	2020	2025	2030 <sup>(a)</sup>
Saline Water Intrusion Barriers	0	0	0	0	0	0	0
Groundwater Recharge <sup>(a)</sup>	Included as part of Urban Water Consumption (see Table 6-5)						
Conjunctive Use <sup>(b)</sup>	Included as part of Groundwater Recharge Program (see discussion above)						
Agricultural	0	0	0	0	0	0	0
Unaccounted For System Losses <sup>(c)</sup>	15,700	15,800	16,300	18,900	20,600	23,300	24,900
<b>Total</b>	<b>15,700</b>	<b>15,800</b>	<b>16,300</b>	<b>18,900</b>	<b>20,600</b>	<b>23,300</b>	<b>24,900</b>

(a) Equals amount of total groundwater recharge which exceeds groundwater pumpage. Based on normal year supply conditions. Groundwater operations assumed to be balanced by 2025.

(b) As discussed above, the City’s intentional groundwater recharge program will allow the City to balance its groundwater operations and conjunctively use its available surface water supplies along with its groundwater supplies.

(c) Assumed to be 10 percent of total production.

**TOTAL WATER USE**

Table 6-9 summarizes the City’s total water use, based on the information presented above in Tables 6-5, 6-6, 6-7, and 6-8.

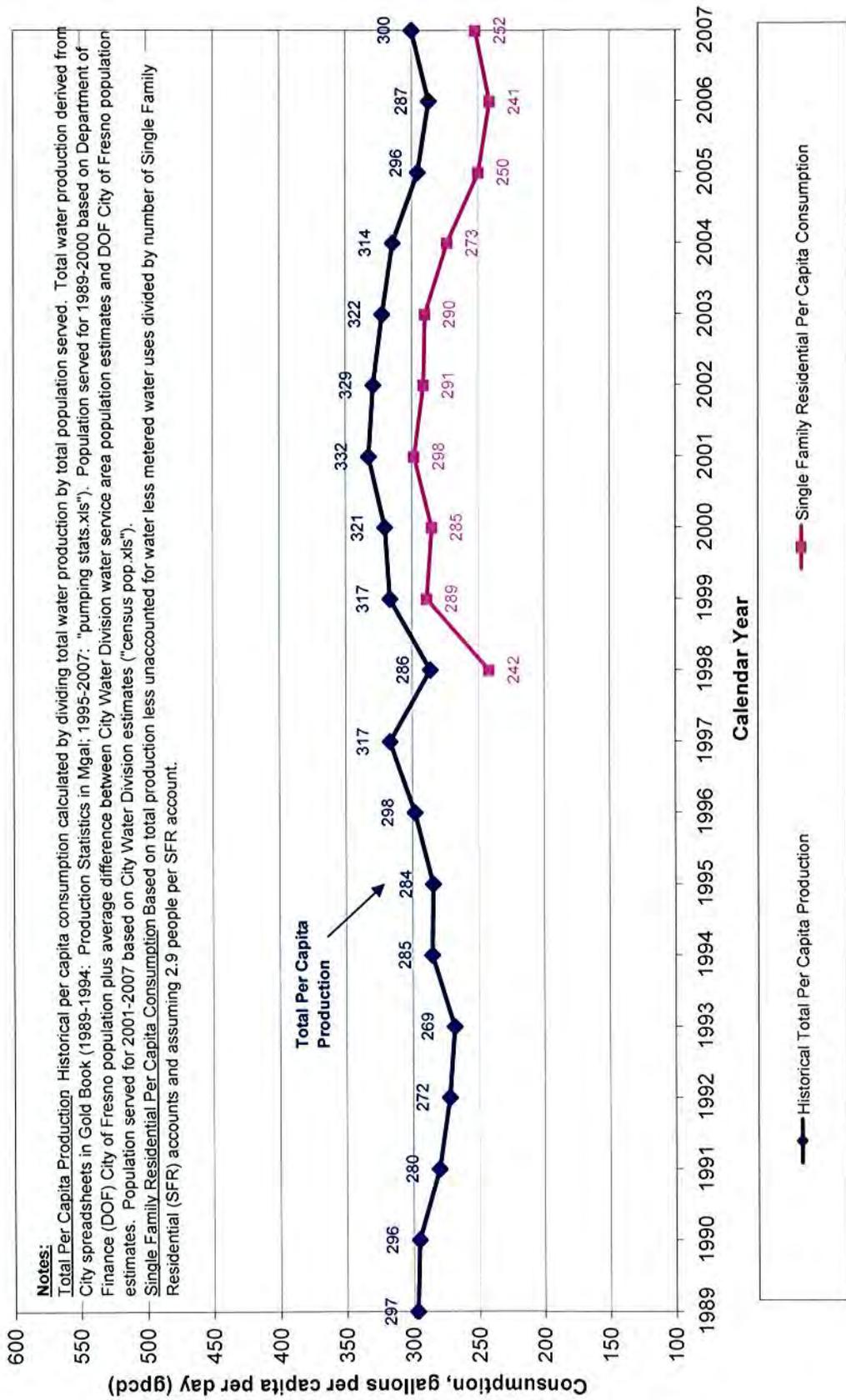
**Table 6-9. Total Water Use (DWR Table 15)**

Water Use	Total Water Use, af/yr						
	2000 (Actual)	2005 (Actual)	2010	2015	2020	2025	2030 <sup>(a)</sup>
Urban Water Consumption <sup>(a)</sup> (from Tables 6-5 and 6-6)	140,900	141,800	147,000	170,400	185,800	210,100	224,100
Sales to Other Agencies (from Table 6-7)	Included as part of Urban Water Consumption						
Saline Water Intrusion Barriers (from Table 6-8)	0	0	0	0	0	0	0
Groundwater Recharge (from Table 6-8)	Included as part of Urban Water Consumption						
Conjunctive Use <sup>(b)</sup> (from Table 6-8)	Included as part of Groundwater Recharge Program						
Agricultural (from Table 6-8)	0	0	0	0	0	0	0
Unaccounted For System Losses (from Table 6-8)	15,700	15,800	16,300	18,900	20,600	23,300	24,900
<b>Total (Urban + UAFW)</b>	<b>156,600</b>	<b>157,600</b>	<b>163,300</b>	<b>189,300</b>	<b>206,400</b>	<b>233,400</b>	<b>249,000</b>

<sup>(a)</sup> Includes additional conservation.

<sup>(b)</sup> As discussed above, the City’s intentional groundwater recharge program will allow the City to balance its groundwater operations by 2025 and conjunctively use its available surface water supplies along with its groundwater supplies.

**Figure 6-1. City of Fresno Historical Per Capita Water Production and Consumption**



**Figure 6-2. Projected Future Per Capita Water Use**

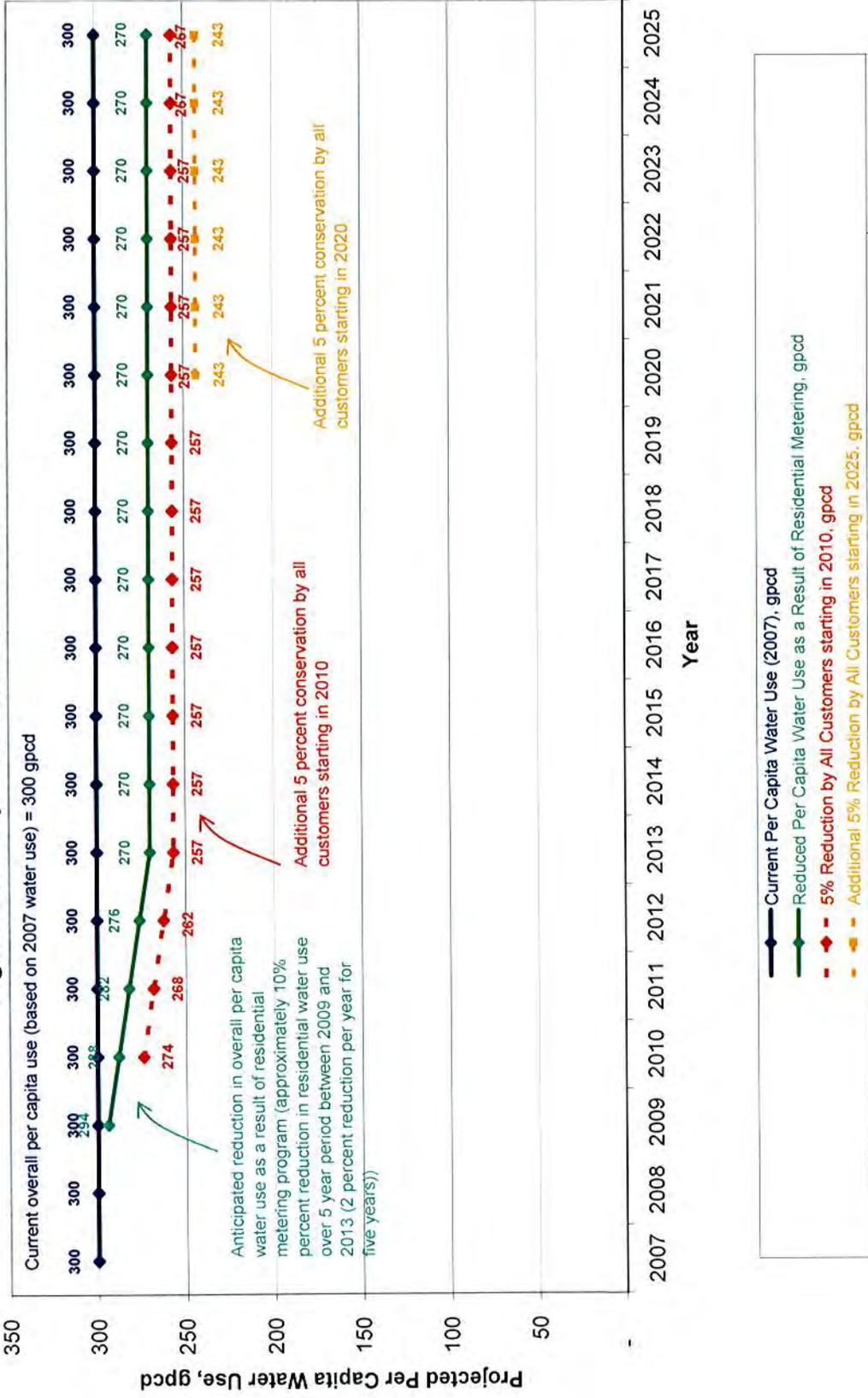


Figure 6-3. Per Capita Based Demand Projections

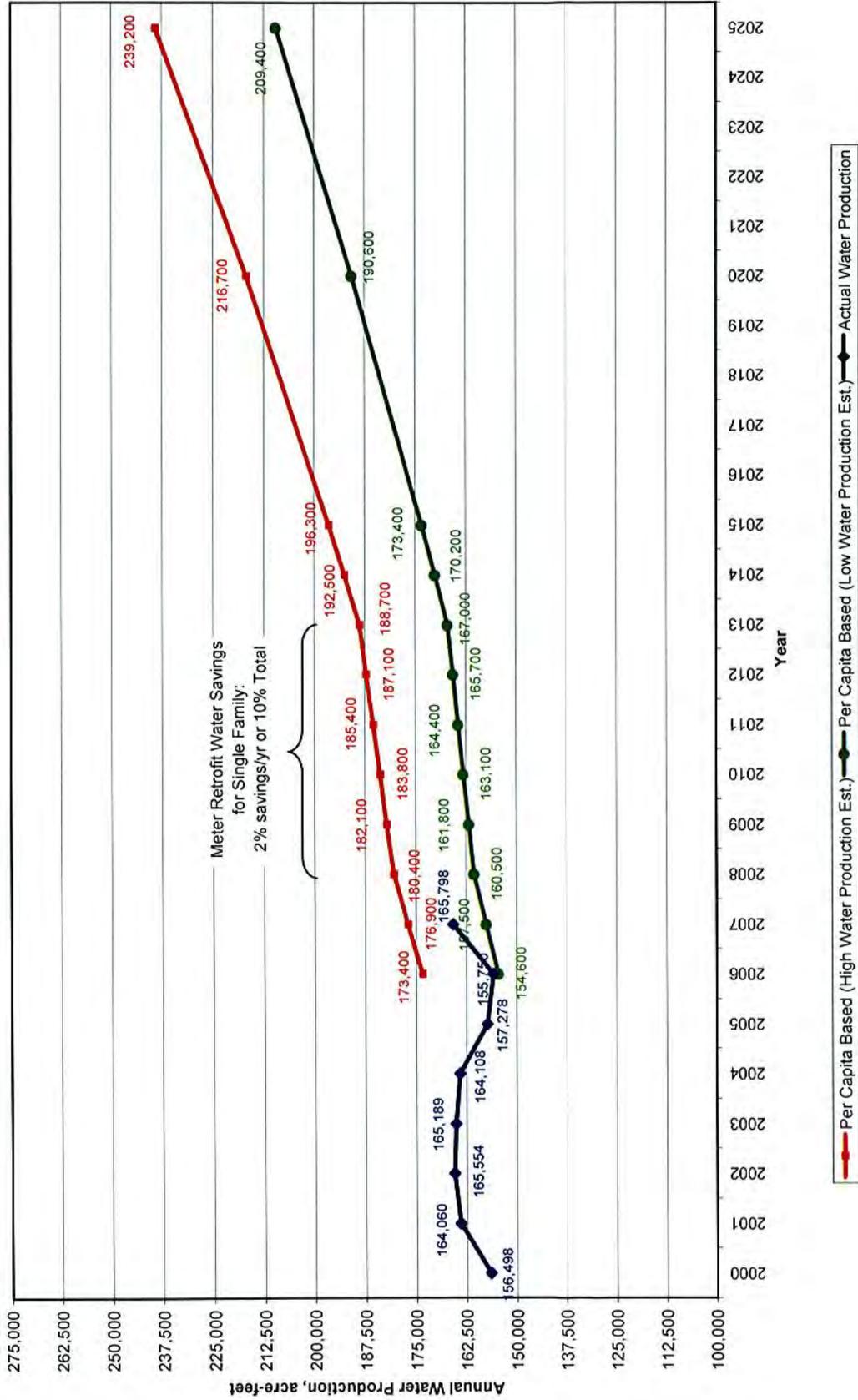


Figure 6-4. Land Use Based Demand Projections

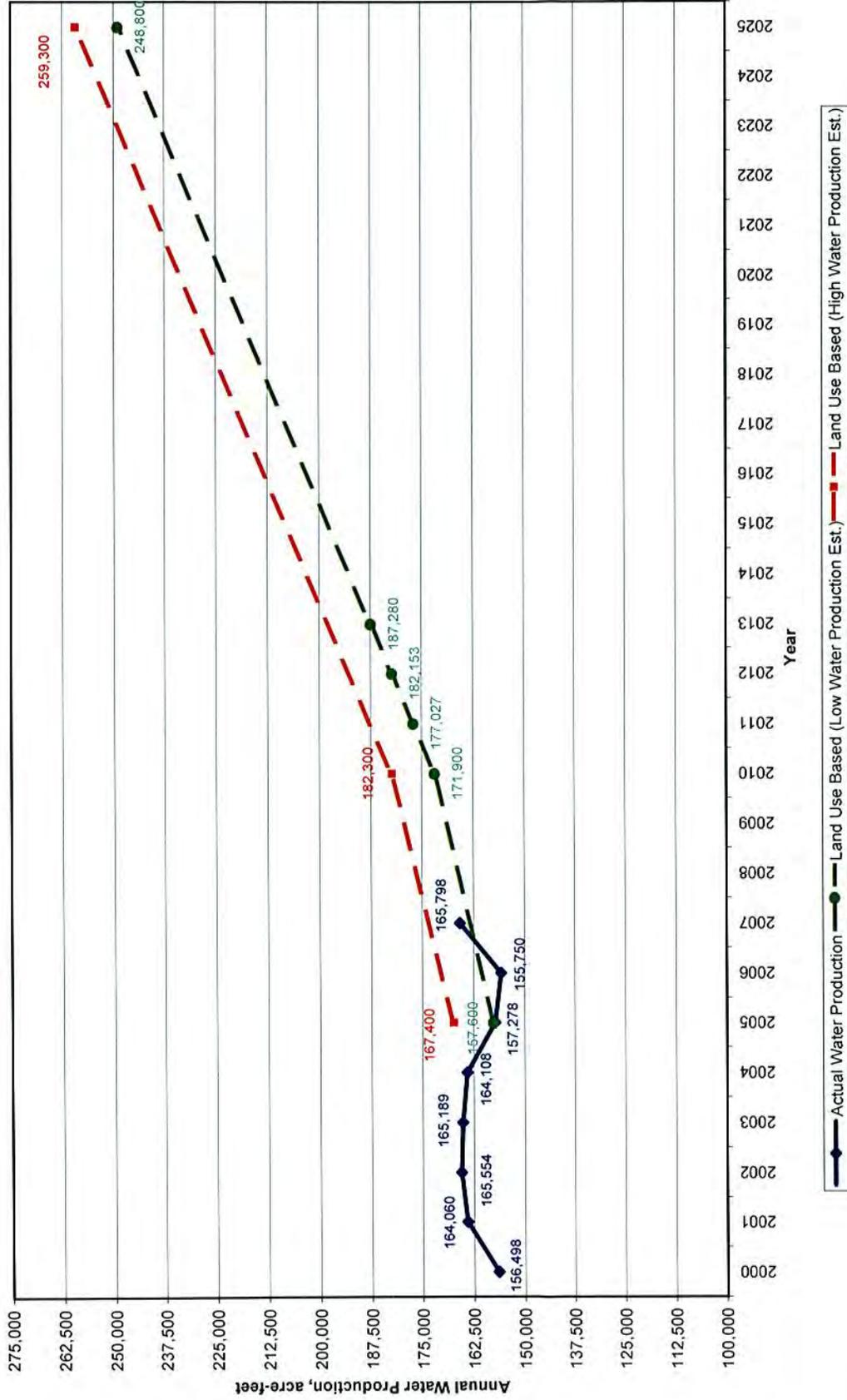


Figure 6-5. Comparison of Per Capita and Land Use Based Demand Projections

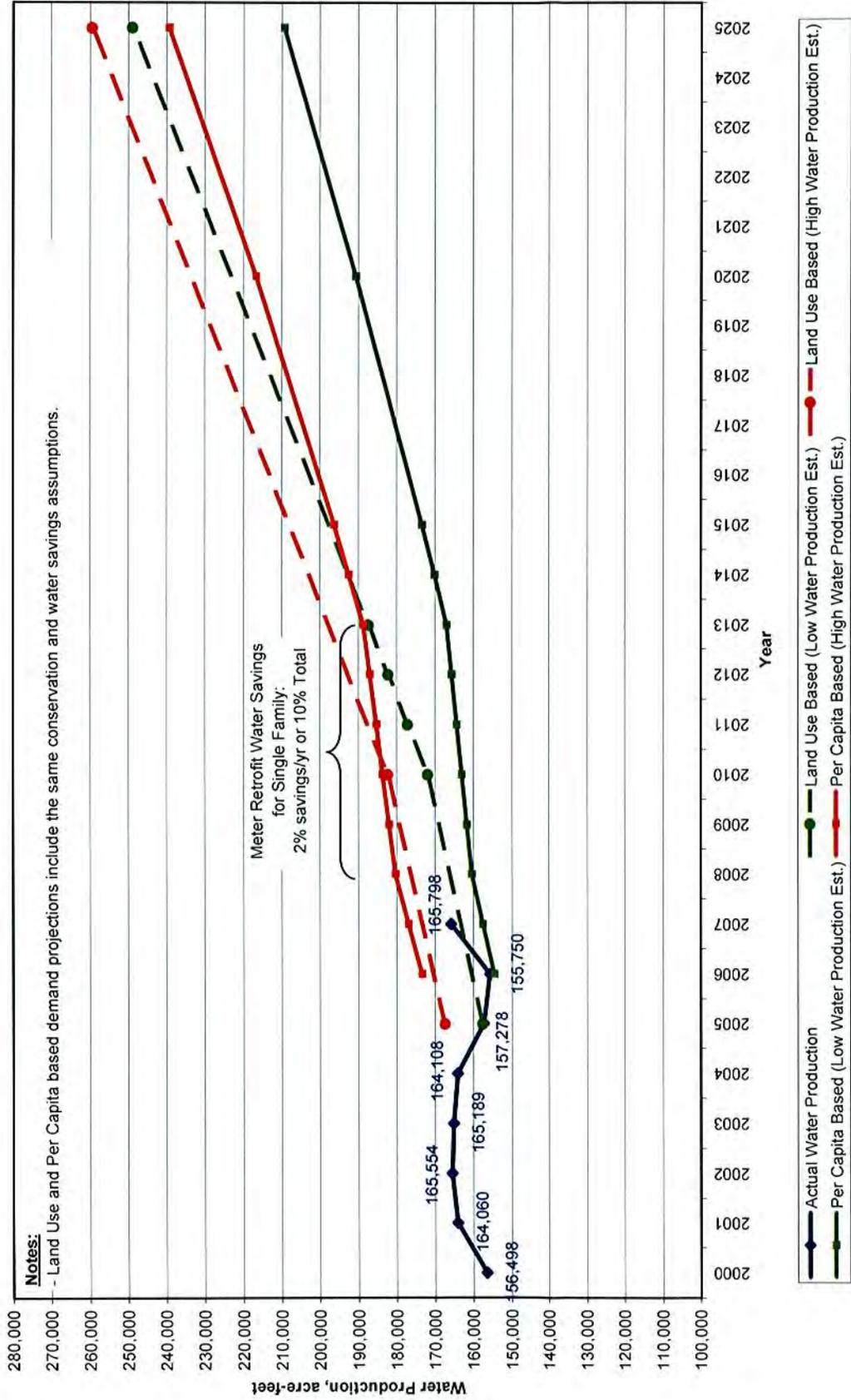
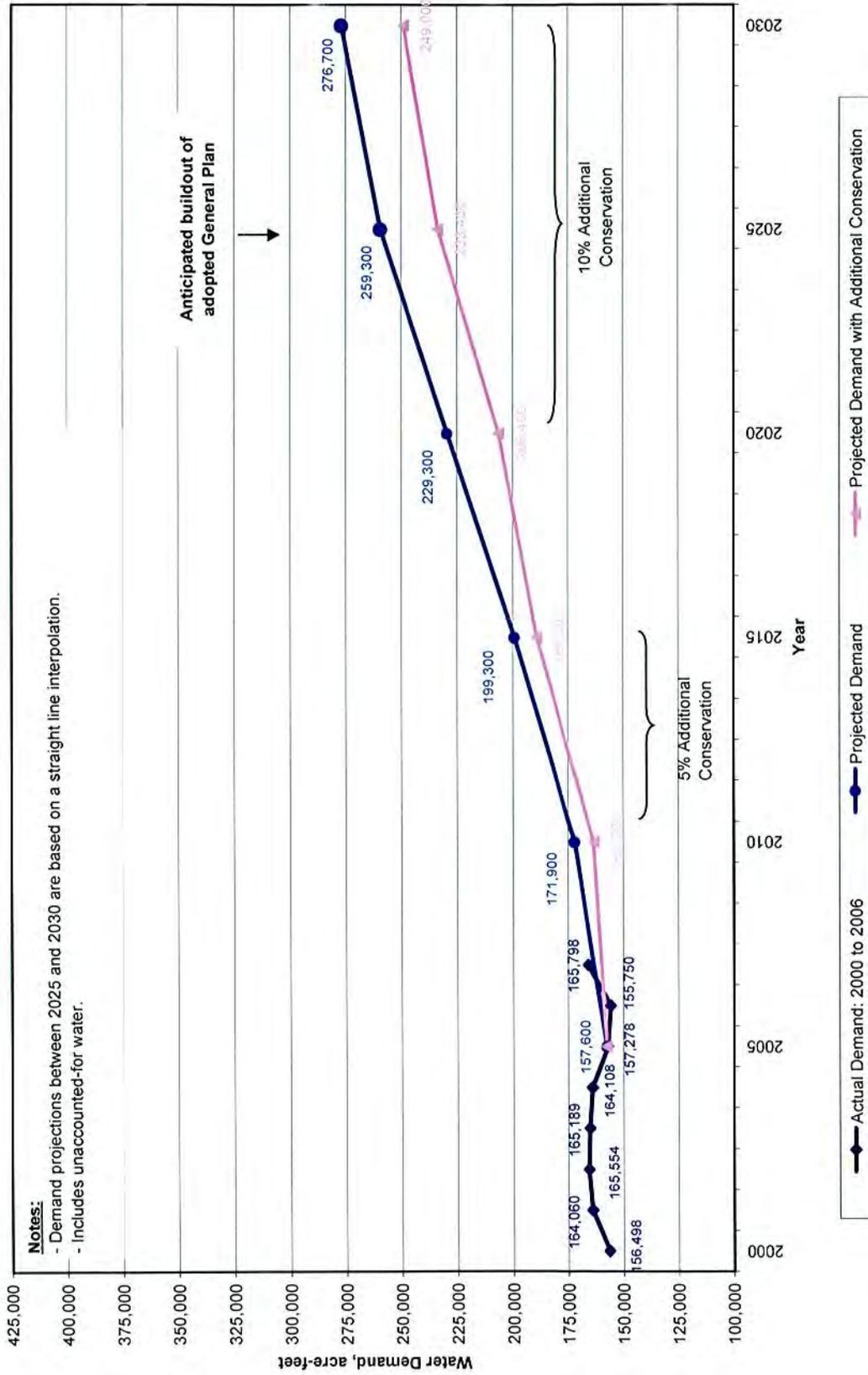


Figure 6-6. Projected Water Demand to 2030



# CHAPTER 7. COMPARISON OF SUPPLY AND DEMAND

## WATER SERVICE RELIABILITY

*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.*

As a summary of the City's future water supply plan (discussed in Chapters 4 and 5), Figure 7-1 provides an overview of the anticipated water supplies proposed to be used to meet the City's projected demands through the year 2030 during normal year water supply conditions. As shown, the future water supplies include treated surface water, groundwater, and recycled water.

This chapter presents the City's anticipated water service reliability, in terms of supply versus demand, for normal water years, single dry water years, and multiple dry water years.

### Normal Water Years

Based on the existing and projected future water supplies discussed in Chapter 4, and the projected reliability of those supplies as described in Chapter 5, Table 7-1 presents the City's projected normal water year supply through the year 2030. As shown, the existing and future supplies include groundwater, treated surface water, and recycled water.

Table 7-2 presents the City's projected normal water year demand through the year 2030. As previously described in Chapter 6, these projected demands include additional conservation and unaccounted for water.

Table 7-3 presents a comparison of the projected normal water year supply and demand. As shown, the projected supply equals the projected demand, indicating no supply shortfalls in normal years.

Figure 7-2 graphically shows the projected normal water year supply and demand to the year 2030, in five-year increments.

**Table 7-1. Projected Normal Water Year Supply (DWR Table 40)**

Supply Source	Projected Normal Year Water Supply <sup>(a)</sup> , af/yr				
	2010	2015	2020	2025	2030
Groundwater	131,750	95,800	82,000	85,000	100,600
Treated Surface Water	30,800	92,500	123,400	123,400	123,400
Recycled Water	750	1,000	1,000	25,000	25,000
<b>Total Supply</b>	<b>163,300</b>	<b>189,300</b>	<b>206,400</b>	<b>233,400</b>	<b>249,000</b>
% of Normal Year	100%	100%	100%	100%	100%

**Table 7-2. Projected Normal Water Year Demand (DWR Table 41)**

Demand	Projected Normal Year Water Demand <sup>(b)</sup> , af/yr				
	2010	2015	2020	2025	2030
Projected Future Demand	171,900	199,300	229,300	259,300	276,700
Additional Conservation, %	5%	5%	10%	10%	10%
Conservation Savings	(8,600)	(10,000)	(22,900)	(25,900)	(27,700)
<b>Future Demand with Conservation</b>	<b>163,300</b>	<b>189,300</b>	<b>206,400</b>	<b>233,400</b>	<b>249,000</b>
% of Year 2005	104%	120%	131%	148%	158%

**Table 7-3. Projected Normal Water Year Supply and Demand Comparison (DWR Table 42)**

	Supply and Demand Comparison, af/yr				
	2010	2015	2020	2025	2030
<b>Total Supply</b>	<b>163,300</b>	<b>189,300</b>	<b>206,400</b>	<b>233,400</b>	<b>249,000</b>
<b>Total Demand</b>	<b>163,300</b>	<b>189,300</b>	<b>206,400</b>	<b>233,400</b>	<b>249,000</b>
Difference (Supply - Demand)	-	-	-	-	-
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

<sup>(a)</sup> See Chapter 5.

<sup>(b)</sup> See Chapter 6.

### Single Dry Water Years

Based on the existing and projected future water supplies discussed in Chapter 4, and the projected reliability of those supplies as described in Chapter 5, Table 7-4 presents the City's projected single dry year water year supply through the year 2030. Supply reliabilities in single dry years are based on assumed Critical-low conditions (as defined in the 2006 Settlement Agreement) and are summarized as follows:

- Groundwater: 100 percent reliable in single dry years
- Treated Surface Water: 71 to 100 percent reliable in single dry years
- Recycled Water: 100 percent reliable in single dry years

Groundwater supplies are assumed to be 100 percent reliable, even in Critical-low conditions. This is because even though there may be limited groundwater recharge during Critical-low conditions, due to the large storage volume in the groundwater basin, adequate groundwater supplies will be available within the groundwater basin to meet the City's needs during a single dry year. As shown in Table 7-4, groundwater pumpage for a single dry year in 2020 has been increased somewhat above normal year groundwater pumpage to account for reduced surface water availability under critical-low conditions.

Treated surface water is anticipated to be 71 to 100 percent reliable in single dry years due to reduced availability of surface water supplies. The range in reliabilities is a result of the changing surface water treatment capacities over time. For example, the 71 percent reliability is based on surface water availability under Critical-low conditions in 2020 (87,800 af/yr) (see Table 5-5) with a planned surface water treatment capacity of 123,400 af/yr. The 100 percent reliability is based on surface water availability under Critical-low conditions in 2010 (76,900 af/yr) (see Table 5-5) with a planned surface water treatment capacity of 30,800 af/yr. Treated surface water reliabilities in 2015, 2025, and 2030, are 89 percent, 76 percent, and 78 percent, respectively.

Recycled water supplies are also assumed to be 100 percent reliable, even in Critical-low conditions. This is because recycled water supplies are considered to be essentially "drought-resistant" as the wastewater flows which generate the recycled water originate primarily from indoor water uses (e.g., toilet flushing, showers, clothes washing, etc.) are not significantly reduced during drought conditions.

Table 7-5 presents the City's projected single dry year water year demand through the year 2030. As previously described in Chapter 6, these projected demands include additional conservation and unaccounted for water, and are assumed to be reduced by an additional 15 percent in single dry years due to mandated water conservation measures, in accordance with the provisions of the City's Water Shortage Contingency Plan (see Chapter 9).

Table 7-6 presents a comparison of the projected single dry year water supply and demand. As shown, the projected supply is greater than the projected demand, largely because of the assumed demand reduction in single dry years.

Figure 7-3 graphically shows the projected single dry year water supply and demand to the year 2030, in five-year increments.

Table 7-4. Projected Single Dry Year Water Year Supply (DWR Table 43)

Supply Source	Projected Single Dry Year Water Supply <sup>(a)</sup> , af/yr				
	2010	2015	2020	2025	2030
Groundwater	131,750	95,800	86,600 (c)	85,000	100,600
Treated Surface Water	30,800	82,300	87,800	93,300	96,800
Recycled Water	750	1,000	1,000	25,000	25,000
Total Supply	163,300	179,100	175,400	203,300	222,400
% of Projected Normal	100%	95%	85%	87%	89%

Table 7-5. Projected Single Dry Year Water Year Demand (DWR Table 44)

Demand	Projected Single Dry Year Water Demand <sup>(b)</sup> , af/yr				
	2010	2015	2020	2025	2030
Projected Future Demand	171,900	199,300	229,300	259,300	276,700
Additional Future Conservation, %	5%	5%	10%	10%	10%
Future Conservation Savings	(8,600)	(10,000)	(22,900)	(25,900)	(27,700)
Future Demand with Conservation	163,300	189,300	206,400	233,400	249,000
Mandated Conservation in Single Dry Year, %	15%	15%	15%	15%	15%
Mandated Conservation Savings	(24,500)	(28,400)	(31,000)	(35,000)	(37,400)
Total Demand	138,800	160,900	175,400	198,400	211,600
% of Projected Normal	85%	85%	85%	85%	85%

Table 7-6. Projected Single Dry Year Supply and Demand Comparison (DWR Table 45)

	Supply and Demand Comparison, af/yr				
	2010	2015	2020	2025	2030
Total Supply	163,300	179,100	175,400	203,300	222,400
Total Demand	138,800	160,900	175,400	198,400	211,600
Difference (Supply - Demand)	24,500	18,200	-	4,900	10,800
Difference as % of Supply	15%	10%	0%	2%	5%
Difference as % of Demand	18%	11%	0%	2%	5%

<sup>(a)</sup> See Chapter 5.

<sup>(b)</sup> See Chapter 6. Demands reduced by 15% in single dry years.

<sup>(c)</sup> In 2020, in single dry years, the surface water supplies are reduced such that required groundwater pumping is increased (to 86,600 af/yr), which is above that required in normal years (82,000 af/yr).

### **Multiple Dry Water Years**

For each of the multiple dry year scenarios described below, a five-year period has been assumed with different hydrologic conditions as defined in the 2006 Settlement Agreement, with the first two years being Normal-dry, the third and fourth years being Dry, and the fifth year being Critical-low (as assumed for the Single Dry Water Year discussed previously). For each case, supply reliabilities (described in Chapter 5) are summarized as follows:

- Groundwater: 100 percent reliable in Normal-dry, Dry and Critical-low years
- Treated Surface Water: 100 percent reliable in Normal-dry and Dry years and 71 to 100 percent reliable in Critical-low years
- Recycled Water: 100 percent reliable in Normal-dry, Dry and Critical-low years

Also, in accordance with the provisions of the City's Water Shortage Contingency Plan provided in Chapter 9 of this UWMP, projected demands in the third and fourth years of a multiple dry year period are assumed to be reduced by 10 percent due to mandated conservation measures consistent with Dry year conditions. For the fifth year of a multiple dry year period, projected demands are assumed to be reduced by 15 percent due to mandated conservation measures consistent with Critical-low conditions.

#### Multiple Dry Years Ending in 2010

Table 7-7 shows the projected supply during a multiple dry year period ending in 2010. Table 7-8 shows the projected demand during a multiple dry year period ending in 2010. Table 7-9 shows the supply and demand comparison during a multiple dry year period ending in 2010. As shown, as a result of reduced demands in the Dry third and fourth years and Critical-low fifth year, there are no projected supply shortfalls.

#### Multiple Dry Years Ending in 2015

Table 7-10 shows the projected supply during a multiple dry year period ending in 2015. Table 7-11 shows the projected demand during a multiple dry year period ending in 2015. Table 7-12 shows the supply and demand comparison during a multiple dry year period ending in 2015. As shown, as a result of reduced demands in the Dry third and fourth years and Critical-low fifth year, there are no projected supply shortfalls.

#### Multiple Dry Years Ending in 2020

Table 7-13 shows the projected supply during a multiple dry year period ending in 2020. Table 7-14 shows the projected demand during a multiple dry year period ending in 2020. Table 7-15 shows the supply and demand comparison during a multiple dry year period ending in 2020. As shown, as a result of reduced demands in the Dry third and fourth years and Critical-low fifth year, there are no projected supply shortfalls.

**Table 7-7. Projected Supply During Multiple Dry Year Period Ending in 2010 (DWR Table 46)<sup>(c)</sup>**

Supply Source	Projected Multiple Dry Year Water Supply <sup>(a)</sup> , af/yr				
	2006	2007	2008	2009	2010
Groundwater	136,050	145,150	137,450	140,150	131,750
Treated Surface Water	19,700	20,650	28,300	28,300	30,800
Recycled Water	-	-	750	750	750
Total	155,750	165,800	166,500	169,200	163,300
% of Projected Normal	100%	100%	100%	100%	100%

**Table 7-8. Projected Demand During Multiple Dry Year Period Ending in 2010 (DWR Table 47)**

Demand	Projected Multiple Dry Year Water Demand <sup>(b)</sup> , af/yr				
	2006	2007	2008	2009	2010
Projected Future Demand	155,750	165,800	166,500	169,200	171,900
Additional Future Conservation, %	0%	0%	0%	0%	5%
Future Conservation Savings	-	-	-	-	(8,600)
Future Demand with Conservation	155,750	165,800	166,500	169,200	163,300
Mandated Conservation in Multiple Dry Year, %	0%	0%	10%	10%	15%
Mandated Conservation Savings	-	-	(16,700)	(16,900)	(24,500)
Total Demand	155,750	165,800	149,800	152,300	138,800
% of Projected Normal	100%	100%	90%	90%	85%

**Table 7-9. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2010 (DWR Table 48)**

	Supply and Demand Comparison, af/yr				
	2006	2007	2008	2009	2010
Total Supply	155,750	165,800	166,500	169,200	163,300
Total Demand	155,750	165,800	149,800	152,300	138,800
Difference (Supply - Demand)	-	-	16,700	16,900	24,500
Difference as % of Supply	0%	0%	10%	10%	15%
Difference as % of Demand	0%	0%	11%	11%	18%

<sup>(a)</sup> See Chapter 5.

<sup>(b)</sup> See Chapter 6. Demands reduced by 10% in Dry years (3rd and 4th years) and 15% in Critical-low years (5th year).

<sup>(c)</sup> Supply and demand values for 2006 and 2007 are based on actual production data for those years.

**Table 7-10. Projected Supply During Multiple Dry Year Period Ending in 2015 (DWR Table 49)**

Supply Source	Projected Multiple Dry Year Water Supply <sup>(a)</sup> , af/yr				
	2011	2012	2013	2014	2015
Groundwater	136,900	142,150	147,300	152,450	95,800
Treated Surface Water	30,800	30,800	30,800	30,800	82,300
Recycled Water	800	850	900	950	1,000
<b>Total</b>	<b>168,500</b>	<b>173,800</b>	<b>179,000</b>	<b>184,200</b>	<b>179,100</b>
% of Projected Normal	100%	100%	100%	100%	95%

**Table 7-11. Projected Demand During Multiple Dry Year Period Ending in 2015 (DWR Table 50)**

Demand	Projected Multiple Dry Year Water Demand <sup>(b)</sup> , af/yr				
	2011	2012	2013	2014	2015
Projected Future Demand	177,400	182,900	188,400	193,900	199,300
Additional Future Conservation, %	5%	5%	5%	5%	5%
Future Conservation Savings	(8,900)	(9,100)	(9,400)	(9,700)	(10,000)
Future Demand with Conservation	168,500	173,800	179,000	184,200	189,300
Mandated Conservation in Multiple Dry Year, %	0%	0%	10%	10%	15%
Mandated Conservation Savings	-	-	(17,900)	(18,400)	(28,400)
<b>Total Demand</b>	<b>168,500</b>	<b>173,800</b>	<b>161,100</b>	<b>165,800</b>	<b>160,900</b>
% of Projected Normal	100%	100%	90%	90%	85%

**Table 7-12. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2015 (DWR Table 51)**

	Supply and Demand Comparison, af/yr				
	2011	2012	2013	2014	2015
Total Supply	168,500	173,800	179,000	184,200	179,100
Total Demand	168,500	173,800	161,100	165,800	160,900
Difference (Supply - Demand)	-	-	17,900	18,400	18,200
Difference as % of Supply	0%	0%	10%	10%	10%
Difference as % of Demand	0%	0%	11%	11%	11%

<sup>(a)</sup> See Chapter 5.

<sup>(b)</sup> See Chapter 6. Demands reduced by 10% in Dry years (3rd and 4th years) and 15% in Critical-low years (5th year)

**Table 7-13. Projected Supply During Multiple Dry Year Period Ending in 2020 (DWR Table 52)**

Supply Source	Projected Multiple Dry Year Water Supply <sup>(a)</sup> , af/yr				
	2016	2017	2018	2019	2020
Groundwater	101,500	107,200	112,900	118,600	86,600 (c)
Treated Surface Water	92,500	92,500	92,500	92,500	87,800
Recycled Water	1,000	1,000	1,000	1,000	1,000
Total	195,000	200,700	206,400	212,100	175,400
% of Projected Normal	100%	100%	100%	100%	85%

**Table 7-14. Projected Demand During Multiple Dry Year Period Ending in 2020 (DWR Table 53)**

Demand	Projected Multiple Dry Year Water Demand <sup>(b)</sup> , af/yr				
	2016	2017	2018	2019	2020
Projected Future Demand	205,300	211,300	217,300	223,300	229,300
Additional Future Conservation, %	5%	5%	5%	5%	10%
Future Conservation Savings	(10,300)	(10,600)	(10,900)	(11,200)	(22,900)
Future Demand with Conservation	195,000	200,700	206,400	212,100	206,400
Mandated Conservation in Multiple Dry Year, %	0%	0%	10%	10%	15%
Mandated Conservation Savings	-	-	(20,600)	(21,200)	(31,000)
Total Demand	195,000	200,700	185,800	190,900	175,400
% of Projected Normal	100%	100%	90%	90%	85%

**Table 7-15. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2020 (DWR Table 54)**

	Supply and Demand Comparison, af/yr				
	2016	2017	2018	2019	2020
Total Supply	195,000	200,700	206,400	212,100	175,400
Total Demand	195,000	200,700	185,800	190,900	175,400
Difference (Supply - Demand)	-	-	20,600	21,200	-
Difference as % of Supply	0%	0%	10%	10%	0%
Difference as % of Demand	0%	0%	11%	11%	0%

<sup>(a)</sup> See Chapter 5.

<sup>(b)</sup> See Chapter 6. Demands reduced by 10% in Dry years (3rd and 4th years) and 15% in Critical-low years (5th year).

<sup>(c)</sup> In 2020, in multiple dry years, the surface water supplies are reduced such that required groundwater pumping is increased (to 86,600 af/yr), which is above that required in normal years (82,000 af/yr).

Multiple Dry Years Ending in 2025

Table 7-16 shows the projected supply during a multiple dry year period ending in 2025. Table 7-17 shows the projected demand during a multiple dry year period ending in 2025. Table 7-18 shows the supply and demand comparison during a multiple dry year period ending in 2025. As shown, as a result of reduced demands in the Dry third and fourth years and Critical-low fifth year, there are no projected supply shortfalls.

Multiple Dry Years Ending in 2030

Table 7-19 shows the projected supply during a multiple dry year period ending in 2030. Table 7-20 shows the projected demand during a multiple dry year period ending in 2030. Table 7-21 shows the supply and demand comparison during a multiple dry year period ending in 2030. As shown, as a result of reduced demands in the Dry third and fourth years and Critical-low fifth year, there are no projected supply shortfalls.

Figure 7-4 graphically shows the projected multiple dry year water supply and demand to the year 2030, in five year increments.

**Table 7-16. Projected Supply During Multiple Dry Year Period Ending in 2025 (DWR Table 55)**

Supply Source	Projected Multiple Dry Year Water Supply <sup>(a)</sup> , af/yr				
	2021	2022	2023	2024	2025
Groundwater	87,400	92,800	98,200	103,600	85,000
Treated Surface Water	123,400	123,400	123,400	123,400	93,300
Recycled Water	1,000	1,000	1,000	1,000	25,000
Total	211,800	217,200	222,600	228,000	203,300
% of Projected Normal	100%	100%	100%	100%	87%

**Table 7-17. Projected Demand During Multiple Dry Year Period Ending in 2025 (DWR Table 56)**

Demand	Projected Multiple Dry Year Water Demand <sup>(b)</sup> , af/yr				
	2021	2022	2023	2024	2025
Projected Future Demand	235,300	241,300	247,300	253,300	259,300
Additional Future Conservation, %	10%	10%	10%	10%	10%
Future Conservation Savings	(23,500)	(24,100)	(24,700)	(25,300)	(25,900)
Future Demand with Conservation	211,800	217,200	222,600	228,000	233,400
Mandated Conservation in Multiple Dry Year, %	0%	0%	10%	10%	15%
Mandated Conservation Savings	-	-	(22,300)	(22,800)	(35,000)
Total Demand	211,800	217,200	200,300	205,200	198,400
% of Projected Normal	100%	100%	90%	90%	85%

**Table 7-18. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2025 (DWR Table 57)**

	Supply and Demand Comparison, af/yr				
	2021	2022	2023	2024	2025
Total Supply	211,800	217,200	222,600	228,000	203,300
Total Demand	211,800	217,200	200,300	205,200	198,400
Difference (Supply - Demand)	-	-	22,300	22,800	4,900
Difference as % of Supply	0%	0%	10%	10%	2%
Difference as % of Demand	0%	0%	11%	11%	2%

<sup>(a)</sup> See Chapter 5.

<sup>(b)</sup> See Chapter 6. Demands reduced by 10% in Dry years (3rd and 4th years) and 15% in Critical-low years (5th year)

**Table 7-19. Projected Supply During Multiple Dry Year Period Ending in 2030 (DWR Optional Table)**

Supply Source	Projected Multiple Dry Year Water Supply <sup>(a)</sup> , af/yr				
	2026	2027	2028	2029	2030
Groundwater	88,100	91,200	94,300	97,400	100,600
Treated Surface Water	123,400	123,400	123,400	123,400	96,800
Recycled Water	25,000	25,000	25,000	25,000	25,000
Total	236,500	239,600	242,700	245,800	222,400
% of Projected Normal	100%	100%	100%	100%	89%

**Table 7-20. Projected Demand During Multiple Dry Year Period Ending in 2030 (DWR Optional Table)**

Demand	Projected Multiple Dry Year Water Demand <sup>(b)</sup> , af/yr				
	2026	2027	2028	2029	2030
Projected Future Demand	262,800	266,300	269,800	273,300	276,700
Additional Future Conservation, %	10%	10%	10%	10%	10%
Future Conservation Savings	(26,300)	(26,600)	(27,000)	(27,300)	(27,700)
Future Demand with Conservation	236,500	239,700	242,800	246,000	249,000
Mandated Conservation in Multiple Dry Year, %	0%	0%	10%	10%	15%
Mandated Conservation Savings	-	-	(24,300)	(24,600)	(37,400)
Total Demand	236,500	239,600	218,400	221,200	211,700
% of Projected Normal	100%	100%	90%	90%	85%

**Table 7-21. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2030 (DWR Optional Table)**

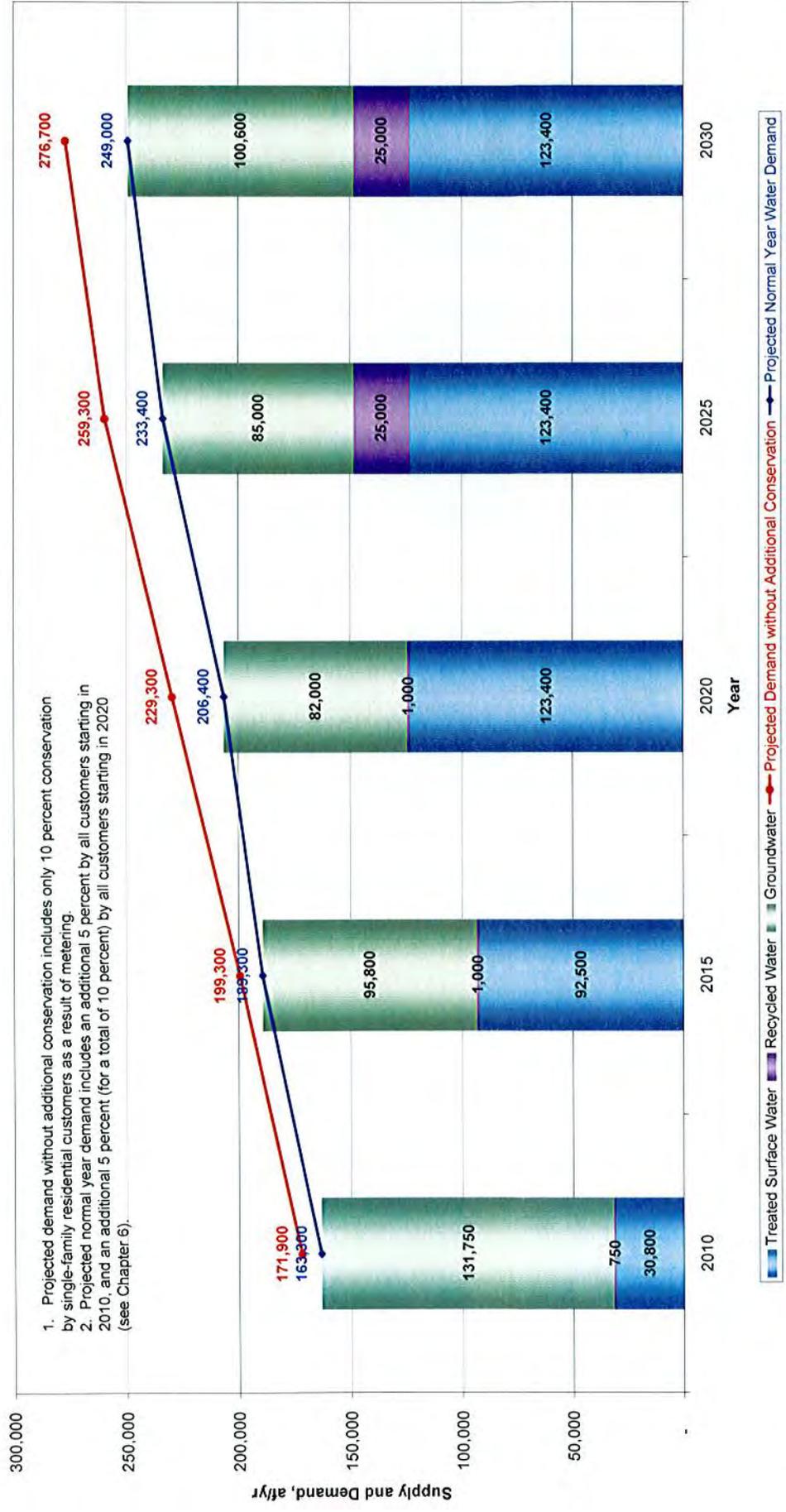
	Supply and Demand Comparison, af/yr				
	2026	2027	2028	2029	2030
Total Supply	236,500	239,600	242,700	245,800	222,400
Total Demand	236,500	239,600	218,400	221,200	211,700
Difference (Supply - Demand)	-	-	24,300	24,600	10,700
Difference as % of Supply	0%	0%	10%	10%	5%
Difference as % of Demand	0%	0%	11%	11%	5%

<sup>(a)</sup> See Chapter 5.

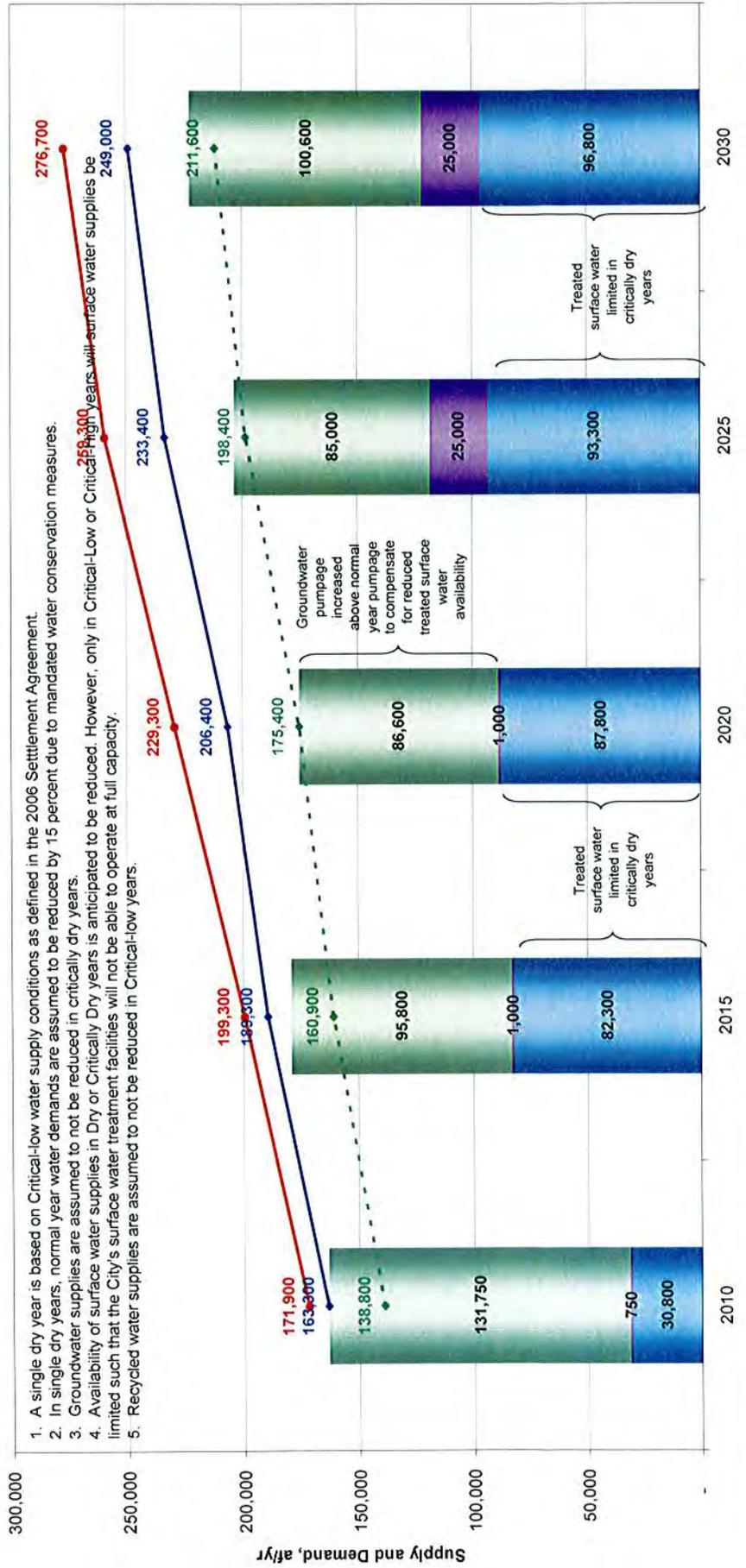
<sup>(b)</sup> See Chapter 6. Demands reduced by 10% in Dry years (3rd and 4th years) and 15% in Critical-low years (5th year)



**Figure 7-2. Projected Normal Water Year Supply and Demand**



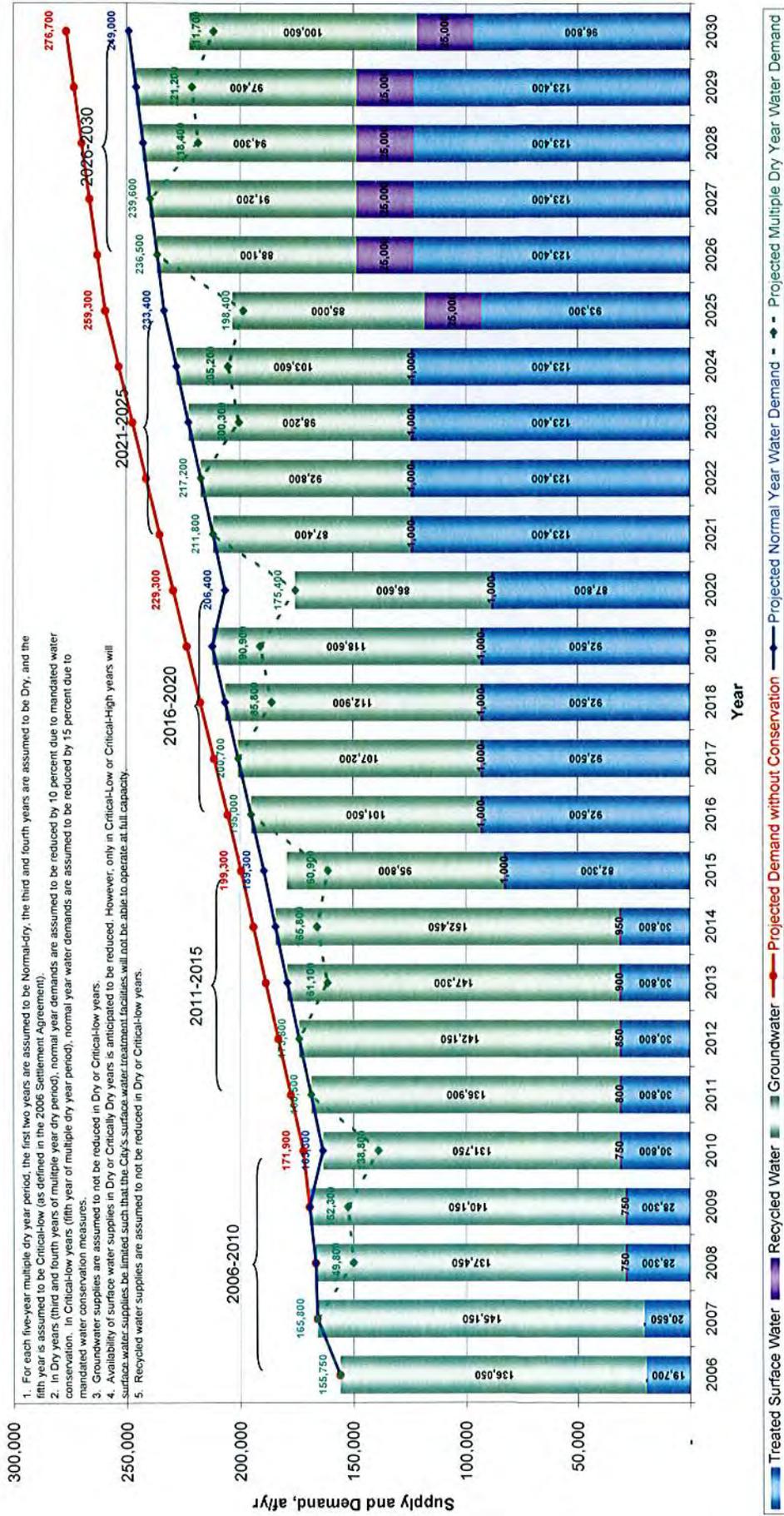
**Figure 7-3. Projected Single Dry Year Water Supply and Demand**



1. A single dry year is based on Critical-low water supply conditions as defined in the 2006 Settlement Agreement.
2. In single dry years, normal year water demands are assumed to be reduced by 15 percent due to mandated water conservation measures.
3. Groundwater supplies are assumed to not be reduced in critically dry years.
4. Availability of surface water supplies in Dry or Critically Dry years is anticipated to be reduced. However, only in Critical-Low or Critical-Dry years will surface water supplies be limited such that the City's surface water treatment facilities will not be able to operate at full capacity.
5. Recycled water supplies are assumed to not be reduced in Critical-low years.



**Figure 7-4. Projected Multiple Dry Year Water Supply and Demand**



1. For each five-year multiple dry year period, the first two years are assumed to be Normal-dry, the third and fourth years are assumed to be Dry, and the fifth year is assumed to be Critical-low (as defined in the 2006 Settlement Agreement).
2. In Dry years (third and fourth years of multiple dry period), normal year demands are assumed to be reduced by 10 percent due to mandated water conservation. In Critical-low years (fifth year of multiple dry year period), normal year water demands are assumed to be reduced by 15 percent due to mandated water conservation measures.
3. Groundwater supplies are assumed to not be reduced in Dry or Critical-low years.
4. Availability of surface water supplies in Dry or Critically Dry years is anticipated to be reduced. However, only in Critical-Low or Critical-High years will surface water supplies be limited such that the City's surface water treatment facilities will not be able to operate at full capacity.
5. Recycled water supplies are assumed to not be reduced in Dry or Critical-low years.

## CHAPTER 8. DEMAND MANAGEMENT MEASURES

This chapter describes the available information on each of the City's water conservation programs as they relate to the fourteen Demand Management Measures (DMMs) included in the Urban Water Management Planning Act. As shown in other chapters of this UWMP, the DWR Guidebook for Preparation of a 2005 Urban Water Management Plan has several recommended tables for presenting the UWMP water supply and demand information. Likewise, DWR has several recommended tables for presenting the DMM information. However, the City has historically not tracked or reported its conservation program efforts in such detail. Therefore, there is currently insufficient data available to complete many of the DWR recommended DMM tables.

The City has, however, started reporting its water conservation activities using the California Urban Water Conservation Council (CUWCC) reporting website. A copy of the City's 2006 report is included in Appendix G of this UWMP.

This chapter describes the following:

- The Urban Water Management Planning Act DMMs and relationship to the CUWCC Best Management Practices (BMPs)
- The City's past and on-going water conservation programs and measures
- A description of the City's current and planned activities and budget allocations for each BMP/DMM
- Determination of DMM implementation
- Evaluation of any DMMs not being implemented
- Discussion of potential future DMMs being considered by the City

### DEMAND MANAGEMENT MEASURES

The Urban Water Management Planning Act includes fourteen DMMs for urban water conservation. These fourteen measures include the following:

1. Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers
2. Residential Plumbing Retrofit
3. System Water Audits, Leak Detection and Repair
4. Metering With Commodity Rates for All New Connections and Retrofit of Existing Connections
5. Large Landscape Conservation Programs and Incentives
6. High-Efficiency Washing Machine Rebate Programs
7. Public Information Programs

8. School Education Programs
9. Conservation Programs for Commercial, Industrial and Institutional Accounts
10. Wholesale Agency Programs
11. Conservation Pricing
12. Water Conservation Coordinator
13. Water Waste Prohibition
14. Residential Ultra-Low-Flush Toilet Replacement Program

These fourteen DMMs are the same as the fourteen Best Management Practices (BMPs) listed in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California. The 1991 MOU originally listed sixteen BMPs for water conservation. In 1999, the MOU was revised to include fourteen BMPs, as listed above.

## **OVERVIEW OF PAST AND CURRENT WATER CONSERVATION PROGRAMS AND MEASURES**

The City of Fresno (City) has a long history of water conservation. A letter dated June 20, 1917 from A.G. Wishon, General Manager of the Fresno City Water Company, to water customers stated that employees would patrol neighborhoods and take action against customers who wasted water. A copy of that letter is provided as Figure 8-1.

On January 1, 1956, the City adopted an ordinance prohibiting the wastage of water. This was one of the first such ordinances passed in California on a permanent basis. The ordinance included the following provisions:

*Section 6-520. Use of Open Hose or Faucet; Wastage of Water<sup>1</sup>*

- (a) *The use of water by means of an open hose or open faucet for irrigation purposes is prohibited. All hose used for irrigation purposes shall have attached thereto a spray nozzle or sprinkling device.*
- (b) *Each consumer of water shall keep all connections, faucets, hydrants, pipes, outlets and plumbing fixtures tight and free from leakage, dripping or waste of water.*
- (c) *The willful waste of water supplied by the City Water Division is prohibited.*
- (d) *The Water Division shall turn off the water connection to any property where any provision of this section is being violated and shall not turn it on again until a fee of five dollars (\$5) for reconnection shall have been paid at the Water Division office in the City Hall.*

Water conservation in Fresno gained renewed emphasis during the 1976-77 drought. Conservation programs that were started then have continued and since 1981 have been supplemented with additional and expanded programs, as described in this chapter. Excerpts

---

<sup>1</sup> This Section of the City Municipal Code has been updated since it was first adopted in 1956. The latest version of Section 6-520. Wastage of Water is provided in Appendix F.

from the City of Fresno's current Municipal Code regarding water regulations and conservation provisions are included in Appendix F.

On December 11, 1991, the City became a signatory agency to the CUWCC's Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California. The purpose of the MOU was to expedite implementation of reasonable water conservation measures in urban areas and to establish appropriate assumptions for use in calculating estimates of reliable future water conservation savings.

Recently, the City also became a partner in the U.S. Environmental Protection Agency's (USEPA) WaterSense program. WaterSense is a voluntary partnership program sponsored by the USEPA with a mission to protect the future of the nation's water supply by promoting and enhancing the market for water-efficient products and services.

The City, as a United States Bureau of Reclamation (USBR) Central Valley Project (CVP) contractor, was required to prepare a Water Conservation Plan as part of their USBR water supply contract renewal in 2005. In May 2005, the City completed its Water Conservation Plan, outlining its current and planned water conservation programs. The Water Conservation Plan was approved by USBR in May 2005 and adopted by the Fresno City Council on July 19, 2005. The fourteen BMPs required by USBR, and outlined in the City's Water Conservation Plan, are the same as the fourteen CUWCC BMPs and Urban Water Management Planning Act DMMs described above. The City submits an annual report to the USBR summarizing the City's water conservation efforts. A copy of the latest report dated February 2007 is provided in Appendix G of this UWMP.

The information provided in this chapter is largely derived from the information provided in Section 4 of the City's 2005 Water Conservation Plan, with updates on recent City water conservation activities based on discussions with the City's Water Conservation Supervisor. A copy of Section 4 of the City's 2005 Water Conservation Plan is provided in Appendix H.

Table 8-1 lists the DMMs/BMPs and provides a brief description of the City's current and planned activities related to each DMM/BMP and current implementation status. Detailed descriptions of the City's DMM/BMP implementation are provided in the next section of this chapter.

## DESCRIPTION OF DMM IMPLEMENTATION

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

- (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:*
  - (A) Water survey programs for single-family residential and multifamily residential customers.*
  - (B) Residential plumbing retrofit.*
  - (C) System water audits, leak detection, and repair.*
  - (D) Metering with commodity rates for all new connections and retrofit of existing connections.*
  - (E) Large landscape conservation programs and incentives.*
  - (F) High-efficiency washing machine rebate programs.*
  - (G) Public information programs.*

Table B-1. Overview of City's Current Water Conservation Activities

Urban Water Management Planning Act & CWCC MOU	DMM/BMP Number	Description	Implementation Status	City Water Conservation Activities	
				Implementation Status	Description
1		Water survey programs for single-family residential and multi-family residential customers	Program currently in place	Interior and exterior water surveys are offered to and performed for single-family and multi-family residential customers upon request	
2		Residential plumbing retrofit	Program currently in place	Low-flow showerheads and faucet aerators are provided to City customers upon request and at public outreach events	
3		System water audits, leak detection and repair	Program to be implemented when City is fully metered (anticipated by 2013)	<ul style="list-style-type: none"> <li>Leak detection pilot programs were conducted in 1998 and 2004</li> <li>Reported leaks are responded to and repaired as quickly as possible</li> <li>A complete system audit will be performed once all customers are metered (by 2013)</li> </ul>	
4		Metering with all new connections and retrofit of existing connections	Program to be in place by 2013	<ul style="list-style-type: none"> <li>Multi-family Residential, Commercial, Industrial and Irrigation connections have always been metered and billed based on consumption (uniform rate)</li> <li>Single-family Residential customers are currently not metered and are billed based on a flat rate. However, in accordance with SD229 and AH514, and the conditions of the CVP contract renewal, all connections, including single-family residential, are required to be metered and be billed at a metered rate by 2013. Metered billing to start in 2010 for single family residential water meter installation plan (installation to start in 2008, complete by 2013)(see Appendix 1)</li> </ul>	
5		Large landscape conservation programs and incentives	Program currently in place	<ul style="list-style-type: none"> <li>Landscape water conservation surveys are offered to and performed for residential and business customers</li> <li>Permits are required for large landscapes which water more frequently than every other day</li> <li>Water Conserving Landscape Requirements are included in the City Municipal Code</li> <li>The City is considering a rebate program for installation of efficient irrigation timers</li> </ul>	
6		High-Efficiency washing machine rebate programs	Program currently in place	<ul style="list-style-type: none"> <li>A P&amp;E rebate program is available to City residents</li> <li>In November 2007, the City implemented a high-efficiency washing machine rebate program.</li> </ul>	
7		Public information programs	Program currently in place	<ul style="list-style-type: none"> <li>The City has an extensive public information program which uses various media to inform customers about the importance of water conservation. The various media include: Television, Radio and Print Advertisements, Newsletters, Customer Billing Inserts, Community Outreach Events, Literature, Speakers Bureau and Water Education Tours</li> </ul>	
8		School education programs	Program currently in place	The City has an extensive Water Education Program for K-12 and college students	
9		Conservation programs for commercial, industrial and institutional (CII) accounts	Partial program currently in place	<ul style="list-style-type: none"> <li>Exterior water conservation surveys are offered and provided to business upon request or during routine monitoring</li> <li>Requirements for water conservation devices are included in the City Municipal Code</li> <li>City requesting a position for a CII water conservation representative;</li> </ul>	
10		Wholesale agency programs	Not applicable	<ul style="list-style-type: none"> <li>The City serves only a small portion of the Pinedale County Water District (about 10 water connections) and the Berns Tract commercial area (via 2 water connections) on a wholesale basis. As such, the City is not considered to be a wholesaler supplier</li> </ul>	
11		Conservation pricing	Program to be in place by 2013	<ul style="list-style-type: none"> <li>Limit the passage of AD514 in 2003, the City Charter prohibited the installation of water meters and reading of water meters for billing purposes for single-family residential uses.</li> <li>SD229 and AH514, and the CVP contract renewal requires that the City install meters on all connections and meter all water deliveries to customers by 2013</li> <li>Multi-family Residential, Commercial, Institutional, Industrial, and Irrigation Customers are metered and are billed based on metered consumption (uniform rate). Single family residential metered billing to begin in 2010 for customers who have meters installed</li> <li>A billing rate schedule for all metered connections will be developed in accordance with the metering plan (see Appendix 1)</li> </ul>	
12		Water conservation coordinator	Program currently in place	The City has a full-time Water Conservation Program Coordinator and support staff	
13		Water waste prohibition	Program currently in place	The City has a Water Waste Hotline and Reporting Form on City Website	
14		Residential ultra-low-flow toilet replacement program	Program currently in place	The City implemented an ultra-low-flow toilet rebate program in March 2006.	

- (H) School education programs.
  - (I) Conservation programs for commercial, industrial, and institutional accounts.
  - (J) Wholesale agency programs.
  - (K) Conservation pricing.
  - (L) Water conservation coordinator.
  - (M) Water waste prohibition.
  - (N) Residential ultra-low-flush toilet replacement programs.
- (2) A schedule of implementation for all water demand management measures proposed or described in the plan.

A description of the City's activities with respect to each DMM is provided below. Information was obtained from the City's 2005 Water Conservation Plan and the City's Water Conservation Supervisor.

In the past, the City has not filed annual reports with the CUWCC regarding water conservation activities. Specific reporting requirements for each DMM/BMP are outlined in Section 4 of the City's Water Conservation Plan, a copy of which is provided in Appendix H.

**DMM 1: Water Survey Programs for Single Family and Multi-Family Residential Customers**

Corresponding BMP

- CUWCC BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Description

The City has few requests for single-family or multi-family interior water surveys. While the City does not have an aggressive media campaign for marketing surveys, it does include the information in outreach literature, website and through direct contact with customers at outreach events, tours and speakers bureau. If a request for an interior survey is received, staff is available to respond. There has been little interest in this service by single-family consumers probably because of low, flat-rate water charges. Multi-family residential customers have also shown little interest, probably due to low water rates. The City has staff available to provide interior water surveys to customers.

However, required City on-site inspections to qualify for water efficient toilet and clothes washer rebates have allowed the City an opportunity to enter customer dwellings. At that time, the City offers and performs an interior survey for willing single-family and multi-family residential customers. Water efficient hardware is also left for the resident, along with hose nozzles for the exterior and an offer to perform an exterior survey.

The City does, however, aggressively market and perform single-family and multi-family residential exterior water surveys, which has the highest water usage. This program is staffed with two Landscape Water Conservation Representatives. Surveys are offered and cost-effective measures are recommended. The program is marketed through media, billing inserts, promotional materials, public outreach events, speaker's bureau, and the City's web site. A

majority of landscape surveys result from the City's free irrigation controller setting program. At the time of the request, customers agree to an exterior survey also. During the exterior survey, City staff provide the following services:

- Landscape water-use surveys include consultation, irrigation system efficiency rating using "catch can" distribution uniformity method or in-depth valve observation method, measurement of turf and other landscaped area.
- Offer plant material tips.
- Irrigation controller setting and water budgeting recommendations with an evapotranspiration chart developed specifically for the region used to develop a written irrigation schedule for the customer.
- Offer to customer to perform interior survey.

To further enhance the exterior landscape program, staff has proposed that the City begin a pilot program in the future to offer rebates to rate payers to purchase updated and more efficient automatic irrigation timers.

#### Implementation Schedule

- Program Status:
  - On-going.
  - Offers for interior and exterior surveys made on an on-going basis to single-family and multi-family residential customers. Current focus is on exterior surveys.
  - The program is marketed through media, billing inserts, promotional materials, public outreach events, speaker's bureau, and the City's web site.
  - Interior and exterior surveys also being offered in conjunction with on-going toilet rebate program.
- Rebates for efficient automatic irrigation timers: Proposed for the future.

#### Annual Budget/Expenditures

FY2005: Actual Budget: \$0

FY2006: Proposed Budget: \$6,000

FY2007: Proposed Budget: \$24,000

FY2008: Proposed Budget: \$43,000

### **DMM 2: Residential Plumbing Retrofit**

#### Corresponding BMP

- CUWCC BMP 02: Residential Plumbing Retrofit

Description

The City provides free low-flow showerheads and faucet aerators to the City's rate payers. These items are distributed based on customer request and are also available during public outreach events and during interior surveys. Recently, fewer requests for showerheads have been received from customers. This is due to the efficiency standards requiring that only low-flow showerheads be sold in this country. Since 1993, the City has provided more than 120,000 showerheads to pre-1992 homes and currently more than 75 percent of pre-1992 homes have low-flow showerheads.

Implementation Schedule

Program Status: Distribution of plumbing retrofit kits are on-going, and provided upon customer request, during interior surveys, and at public outreach events

Annual Budget/Expenditures

- FY2005: Actual Budget: \$0
- FY2006: Proposed Budget: \$0
- FY2007: Proposed Budget: \$0
- FY2008: Proposed Budget: \$0

**DMM 3: System Water Audits, Leak Detection and Repair**

Corresponding BMP

- CUWCC BMP 03: System Water Audits, Leak Detection and Repair

Description

Because the City is not entirely metered, a complete system water audit is not possible at this time. However, the City routinely compiles and compares its water distribution system data to identify any major leaks in the system. In 1998, approximately 60 miles of water mains were tested through a pilot leak detection program. At that time, few leaks were found. Staff is available for the timely repair of all reported leaks.

The City is currently reviewing new leak detection technology. A limited study was conducted in 2004 in a small area of an older section of Fresno using Permalog. No leaks were detected at that time. A full water system audit will be conducted as soon as the City is fully metered, with older neighborhoods being a priority. The City's leak detection program will be enhanced with the onset of the meter installation program, which will begin in 2008, and will be completed by 2013 (see DMM No. 4).

Implementation Schedule

- Pilot leak detection programs: Conducted in 1998 and 2004
- System audit: To be conducted as soon as the City is fully metered

- Leak detection program: To become a priority once meter installation begins in 2008 (see DMM No. 4)

Annual Budget/Expenditures

Funding for this DMM is not included in the City’s Water Conservation budget. The budget for this DMM is included in the City’s Water Operations budget; however, the specific budget for the leak detection program is not available.

**DMM 4: Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections**

Corresponding BMP

- CUWCC BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Description

The City’s multi-family residential, commercial, industrial, institutional, and irrigation water customers (18,531 accounts in FY2007, excluding fire protection connections) are metered and billed based on a standby charge plus a quantity charge based on water usage (see DMM No. 11).

The City’s single-family residential customers (106,457 accounts in FY2007), however, are not metered, and are billed based on a flat rate based on lot size. Table 8-2 provides a summary of the City’s total water service accounts in FY2007.

**Table 8-2. Summary of City Water Accounts in Fiscal Year 2007<sup>(a)</sup>**

Customer Type	Total		Total Accounts
	Metered	Unmetered	
Single-Family Residential	1	106,447	106,448
Multi-Family Residential	7,527	137	7,664
Commercial/Institutional <sup>(b)</sup>	8,037	15	8,052
Industrial	99	0	99
Landscape Irrigation	2,867	0	2,867
Fire Protection <sup>(c)</sup>	0	2,516	2,516
<b>Total</b>	<b>18,531</b>	<b>109,115</b>	<b>127,646</b>
<b>% of Total</b>	<b>14.5%</b>	<b>85.5%</b>	<b>100%</b>

(a) Source: City of Fresno HTE Revenue Report. Data shown for FY07 ending 06/30/07.

(b) Institutional includes schools and municipal connections.

(c) Includes fire protection connections for multi-family residential, commercial/institutional and industrial customers.

Until recently, Article XII, Section 1225 of the City's Charter has prohibited the installation or required installation of water meters at single-family residential connections, and the billing of single-family residential water consumption at a metered rate. All new single-family residential connections (installed after January 1, 1992) have been provided with a meter box and/or meter in accordance with State Water Code Section 525 (adopted by Senate Bill 229 (SB 229) in 1991); however, based on the City Charter, all single-family residential customers are currently billed based on a monthly flat rate according to lot size. A discounted flat rate is also provided for single-family residential customers who are senior citizens.

However, in 2003, Assembly Bill 514 (AB 514) was signed into law. Among other provisions, AB 514 enacted Water Code Section 111 that requires an urban water supplier that receives water from the Federal Central Valley Project to: (1) install water meters on all service connections to residential and non-agricultural commercial buildings located within its service area on or before January 1, 2013; and (2) charge customers for water based on the actual volume of deliveries, as measured by a water meter, on and after March 1, 2013. Compliance with this statute is one of the conditions of the City's USBR Water Supply Agreement renewal.

The requirements of SB 229 and AB 514 have superseded Article XII, Section 1225 of the City's Charter, because these state laws address a subject matter of statewide concern. Also, the State Legislature has declared that these requirements supersede and preempt all conflicting enactments of charter cities, including charter provisions.

The City has developed a meter installation plan and schedule to install meters on all existing customer properties without meters, and charge metered rates, on or before 2013 (metered billing will begin in 2010 for single family residential customers with meters installed). Meter retrofit installations are scheduled to start in 2008. A copy of the meter installation plan and schedule is provided in Appendix I.

#### Implementation Schedule

- Metering and Billing at Commodity Rates: On-going for multi-family residential, commercial, industrial, institutional, and landscape irrigation customers. To start in 2010 for single family residential customers already metered.
- Single-Family Residential Metering Program: Scheduled to begin in 2008 and be completed by 2013.

#### Annual Budget/Expenditures

Funding for this DMM is not included in the City's Water Conservation budget. The budget for this DMM is included in the City's Water Operations budget and will come from the Capital Improvement Program and bonds; however, the specific budget for the metering with commodity rates program is not available.

### **DMM 5: Large Landscape Conservation Programs and Incentives**

#### Corresponding BMP

- CUWCC BMP 05: Large Landscape Conservation Programs and Incentives

Description

The City has a Large Landscape Conservation Program which is staffed with two Landscape Water Conservation Representatives. Landscape surveys are offered and cost-effective repair or enhancement measures are recommended. The City primarily reaches its customers through routine field monitoring, advertising in billing inserts, conservation literature, speakers bureau, tours, web site, and public outreach events. The City is in the process of identifying landscape meter accounts which serve one acre or more of landscape area. Requesting large accounts are surveyed annually and an irrigation schedule is developed within approved time frames in conjunction with the large landscape water permit program. The City is a resource to customers developing annual water budgets.

To further enhance the exterior landscape program, staff has proposed that the City begin a pilot program to offer rebates to rate payers to purchase updated and more efficient automatic irrigation timers.

The City has also adopted water conserving landscape requirements which are specified in the City Municipal Code (Section 6-522. Water Efficient Landscape Standards). These requirements define standards and procedures for the design, installation and management of landscapes in order to utilize available plant, water, land and human resources to the greatest benefit of the people of the City. A copy of the water conserving landscape requirements is provided in Appendix F.

The City is also a supporting partner in the Clovis Botanical Gardens, which serve as a demonstration garden for water conserving landscaping in the region. The City has a park strip demonstration garden at its facilities. The City has also received a grant to develop a demonstration xeriscape median island on a major street.

Implementation Schedule

- Landscape Surveys: On-going
- Water permits for large landscape accounts: On-going
- Rebate program for efficient automatic irrigation controllers: Proposed for the future.
- Water Conserving Landscape Requirements: On-going per City Municipal Code (Section 6-522. Water Efficient Landscape Standards)

Annual Budget/Expenditures

- FY2005: Actual Budget: \$70,205
- FY2006: Proposed Budget: \$70,000
- FY2007: Proposed Budget: \$70,000
- FY2008: Proposed Budget: \$70,000

## **DMM 6: High-Efficiency Washing Machine Rebate Programs**

### Corresponding BMP

- CUWCC BMP 06: High-Efficiency Washing Machine Rebate Programs

### Description

In November 2007, the City implemented a high-efficiency clothes washer rebate program. Residential customers may receive a \$100 rebate for purchasing a qualifying high-efficiency clothes washer. Clothes washers qualifying for the rebate must qualify as an EnergySTAR labeled appliance and meet the Consortium for Energy Efficiency (CEE) Standards for energy and water consumption standards with a Water Factor (WF) of 6.0 or less.

PG&E also has a rebate program which the City's water customers may be eligible for, depending on what type of washing machine they purchase. For a \$35 rebate (Level 1), the clothes washer must have a Modified Energy Factor (MEF) of 1.42 to 1.59 and a Water Factor (WF) of 9.5 or lower. For a \$75 rebate (Level 2), the clothes washer must have a MEF of 1.60 or greater and a WF of 8.5 or lower.

The City also participates in the State of California's Flex Your Power (FYP) program. A letter of support for the FYP program was sent by the City at the request of the California Urban Water Conservation Council. In April 2004, the California Water Awareness Campaign and the Flex Your Power energy efficiency program joined together to promote water and energy efficient appliances. Centered around Earth Day, over 40 water agencies, including the City of Fresno, participated in the project by choosing local non-profit organizations to receive new EnergySTAR clothes washers and dryers. Information on the City's high-efficiency clothes washer and toilet rebate programs are listed on the Flex Your Power webpage.

### Implementation Schedule

- PG&E Rebate Program: On-going
- City Rebate Program: Started in November 2007
- City support of California's Flex Your Power Program: On-going

### Annual Budget/Expenditures

FY2005: Actual Budget: \$0

FY2006: Proposed Budget: \$0

FY2007: Proposed Budget: \$0

FY2008: Proposed Budget: \$0

## **DMM 7: Public Information Programs**

### Corresponding BMP

- CUWCC BMP 07: Public Information Programs

### Description

The City's water conservation public information program is managed in-house with the assistance of a contracted public relations firm. The firm's services include strategic planning, creative concepts, public relations, marketing, promotion, research, advertising, media placement, production and design, copy writing, event production and marketing and online services.

The City's public information program has many components including multi-media campaigns (paid and public service advertising); customer billing inserts; literature; public outreach activities, speakers bureau and inter-agency partnerships. Many of the City's water conservation materials are provided in three languages: English, Hmong and Spanish. Bilingual City conservation employees who speak these languages are also available.

The City is a member of the Central Valley Water Awareness Committee (CVWAC), which is comprised of several cities, water utilities, irrigation districts and other groups in the Central Valley. The CVWAC was created to increase the public's understanding of how water is treated, managed and delivered to customers. The City participates in Water Awareness Month activities through its affiliation with the CVWAC.

In the past, the City has informally kept records of these related public information activities. In 2005, the City began keeping formal and accurate records of these activities for submittal to the CUWCC.

### Implementation Schedule

- Paid Advertising: On-going
- Public Service Announcements: On-going
- Water Bill Inserts, Newsletters and Brochures: On-going
- Special Events, Media Events: On-going
- Speaker's Bureau: On-going

### Annual Budget/Expenditures

FY2005: Actual Budget: \$200,000

FY2006: Proposed Budget: \$200,000

FY2007: Proposed Budget: \$200,000

FY2008: Proposed Budget: \$200,000

## **DMM 8: School Education Programs**

### Corresponding BMP

- CUWCC BMP 08: School Education Programs

### Description

The City works with schools in the Fresno customer service area through its School Education Program. The Water Education Coordinator is a certified teacher on contract with the City, who has developed the program and is available for presentations to students, teachers and community groups. Some of these education programs are recorded for future use.

In the 2003/04 school year, 23 school presentations were made, reaching 659 students. One teacher workshop was also conducted.

The Water Education Coordinator is also attending Environmental Education Initiative (EEI) workshops in regard to the statewide curriculum. The first three of four phases have been completed, designing and pilot testing grade-level curricula aligned with state teaching standards.

### Implementation Schedule

- School Outreach Program: On-going

### Annual Budget/Expenditures

FY2005: Actual Budget: \$45,811

FY2006: Proposed Budget: \$45,600

FY2007: Proposed Budget: \$45,600

FY2008: Proposed Budget: \$45,600

## **DMM 9: Conservation Programs for Commercial, Industrial and Institutional Accounts**

### Corresponding BMP

- CUWCC BMP 09: Conservation Programs for Commercial, Industrial and Institutional Accounts

### Description

The City rarely receives a request regarding interior water conservation surveys for CII accounts. The City does not currently have qualified staff for this program and cannot respond to requests. The City does conduct exterior surveys for CII accounts upon request, or as a result of routine monitoring.

The City does have an ordinance which requires water conservation devices on water-cooled refrigeration units and evaporative coolers, which are primarily associated with CII accounts. The provisions of the ordinance have been incorporated into the City Municipal Code (Section 6-519. Water Conservation Device Required). A copy of the pertinent sections of the Municipal Code are provided in Appendix F.

Implementation Schedule

- Commercial, Industrial and Institutional Water Use Surveys: Requesting staff position or during routine monitoring
- Requirements for Water Conservation Devices: On-going per City Municipal Code (Section 6-519. Water Conservation Device Required)
- Exterior Surveys conducted: On-going

Annual Budget/Expenditures

FY2005: Actual Budget: \$16,384  
 FY2006: Proposed Budget: \$8,000  
 FY2007: Proposed Budget: \$15,000  
 FY2008: Proposed Budget: \$15,000

**DMM 10: Wholesale Agency Programs**

Corresponding BMPs

- CUWCC BMP 10: Wholesale Agency Programs

Description

The City functions primarily as a retail water purveyor for the City of Fresno water service area. The City does provide water on a wholesale basis to two limited areas within the City’s water service area:

- Portion of Pinedale County Water District east of Highway 41, and
- Berans Tract area.

The City provides water on a wholesale basis to a small number of customers located within the portion of the Pinedale County Water District which lies east of Highway 41. This area of Pinedale east of Highway 41 consists of approximately 28 water service connections (two metered and 26 unmetered) which are essentially cut off from the remaining Pinedale system by Highway 41 and have no other water supply. These customers are billed by Pinedale, which in turn pays the City for providing the water supply.

The City also provides water on a wholesale basis to the Berans Tract area, a County island. The City serves this area via two water connections from the City.

These wholesale water service arrangements are considered to be a relatively minor part of the City's overall water system operations. Therefore, for purposes of DMM 10, the City is not considered to be a water wholesaler. As such, wholesale agency programs are not considered applicable to the City.

Implementation Schedule

Not applicable to City.

Annual Budget/Expenditures

Not applicable to City.

**DMM 11: Conservation Pricing**

Corresponding BMP

- CUWCC BMP 11: Conservation Pricing

Description

As described for DMM 4, only about 14 percent of the City's customer accounts are metered and billed based on usage. This is primarily because the City Charter has, until recently, prohibited the metering of single-family residential accounts. For the City's unmetered single-family residential customers, the City currently bills a flat monthly water rate based on lot size as shown in Table 8-3.

**Table 8-3. City of Fresno Water Rates for Unmetered Services (Single-Family Residential Only)<sup>(a)</sup>**

Customer Type	Water Service Charge (Flat Rate, per month)
Single-Family Residential	
First 6,000 square feet or less of lot size	\$18.59
Each additional 100 square feet	\$0.185
Single-Family Residential (Senior Citizen)	
First 6,000 square feet or less of lot size	\$16.72
Each additional 100 square feet	\$0.166

<sup>(a)</sup> Source: City of Fresno Master Fee Schedule Amendment #458 (May 2007), Amend Effective 09/01/07.

For the City's metered customers (including multi-family residential, commercial, industrial, institutional and irrigation), the City has a water rate structure which includes a monthly standby charge based on water meter size, and a uniform monthly quantity use charge based on actual monthly water use (see Table 8-4).

**Table 8-4. City of Fresno Water Rates for Metered Services<sup>(a,b)</sup>**

Water Meter Size	Water Service Charge = Standby Charge + Quantity Charge	
	Monthly Standby Charge, \$	Quantity Charge
¾ inch or smaller	8.16	<ul style="list-style-type: none"> <li>• Each 100 cubic feet (HCF) = \$0.606</li> <li>• Each 1,000 gallons = \$0.809</li> </ul>
1-inch	10.99	
1 ½ inch	15.36	
2-inch	22.03	
3-inch	36.65	
4-inch	51.24	
6-inch	80.50	
8-inch	124.36	
10-inch	146.21	

(a) Source: City of Fresno Master Fee Schedule Amendment #458 (May 2007), Amend Effective 09/01/07.

(b) Includes multi-family residential, commercial, institutional, industrial, and landscape irrigation customers.

The City is currently preparing a rate study, and will prepare future rate studies, which will consider the need for future rate increases, future conversion from flat rates to metered rates for single-family connections, and future conversion from uniform metered rates to increasing block rates for all metered connections in accordance with the requirements of AB514.

The City’s sewer service rates have varying structures based on customer type as summarized in Table 8-5.

Implementation Schedule

- **Single-Family Residential Accounts:** Until recently, metering of single-family residential accounts has been prohibited by the City Charter; all single-family residential accounts are currently billed based on a flat monthly rate. In accordance with the City’s Metering Plan (see DMM No. 4), all single-family residential accounts will be metered by 2013, and will be billed based on actual water consumption.
- **All Other Accounts:** Currently billed based on actual water consumption based on uniform rate structure.
- **Metered Billing Rate Structure for All Service Connections with Meters:** Will be developed in accordance with Metering Plan (see DMM No. 4).

**Table 8-5. City of Fresno Wastewater Rate Structure by Customer Type<sup>(a)</sup>**

Customer Type	Sewer Service Charge Structure/Rate
Single-Family Residential	Flat Rate/Month: \$17.67/month
Single-Family Residential (Senior Citizen)	Flat Rate/Month: \$15.90/month
Multi-Family Residential	Flat Rate/Month Per Unit: \$17.67/month for first unit \$11.87/month for each additional unit
Schools	Flat Rate Per Student Per Year (based on average daily attendance):
Kindergarten/Elementary	\$10.948/student/year
Middle	\$16.989/student/year
Senior High	\$20.491/student/year
Parochial	\$5.923/student/year
College	\$7.305/student/year
Industrial	Uniform Rate per HCF of:
High Industrial (Sewage effluent of 25,000 gpd or higher or Biochemical Oxygen Demand (BOD) greater than 265 mg/L or Total Suspended Solids (TSS) greater than 300 mg/L)	Metered Potable Water Used (per HCF) or Metered Sewage Effluent (per HCF) +
Low Industrial	BOD/pound (for High Industrial Customers only) +
	Total Suspended Solids (TSS/pound) (for High Industrial Customers only)
	Rates vary for High and Low Industrial Customers A minimum monthly charge applied to Low Industrial Customers
Commercial	Uniform Rate per HCF of:
High Commercial (BOD or TSS greater or equal to 501 mg/L)	Metered Potable Water Used (per HCF) or
Medium Commercial (BOD or TSS from 201 to 500 mg/L)	Metered Sewage Effluent (per HCF)
Low Commercial (BOD or TSS from 0 to 200 mg/L)	Rates vary for High, Medium and Low Commercial Customers A minimum monthly charge applied to All Commercial Customers

<sup>(a)</sup> Source: City of Fresno Master Fee Schedule Amendment #458 (May 2007), Fees Effective 07/01/07.

Annual Budget/Expenditures

None.

**DMM 12: Water Conservation Coordinator**Corresponding BMP

- CUWCC BMP 12: Water Conservation Coordinator

Description

The City has a full-time Water Conservation Supervisor and eight permanent support staff. The water conservation coordinator and water conservation staff address the water conservation needs for the City of Fresno.

Water Conservation Supervisor (Position created August 1988): Nora Laikam

## Support Staff:

- One Staff Assistant
- Two Water Conservation Representatives
- Two Landscape Conservation Representatives
- One Administrative Clerk
- One Education Coordinator (contracted)
- Four seasonal temporary employees hired from April to November

Implementation Schedule

- Water Conservation Coordinator and Support Staff: On-going

Annual Budget/Expenditures

FY2004: Water Conservation Staffing Budget: \$373,416

**DMM 13: Water Waste Prohibitions**Corresponding BMP

- CUWCC BMP 13: Water Waste Prohibition

Description

The City prohibits water waste through ordinances found in the City Municipal Code (Section 6-520. Wastage of Water) (see Appendix F). The City has a water waste hotline and a reporting form on the City website, and keeps records of water waste violations. The ordinance prohibits gutter flooding and single-pass cooling systems in new connections.

Two Water Conservation Representatives monitor customer water waste through field operations. Communication to the City's diverse customer base is always taken into consideration, so representatives are bilingual, speaking English and either Hmong or Spanish. During the hot season, temporary Water Conservation Representatives are hired to monitor late night and early morning over watering. A seasonal temporary Administrative Clerk is also hired to keep up with the additional paperwork generated.

The program is marketed through media, billing inserts, promotional materials, public outreach events, speaker's bureau, and the City's web site.

#### Implementation Schedule

- Water waste prohibitions: On-going per City Municipal Code (Section 6-520. Wastage of Water)
- Additional drought restrictions: Would be enacted by the City if water supply conditions required additional conservation measures (see Chapter 9. Water Shortage Contingency Plan).

#### Annual Budget/Expenditures

FY2005: Actual Budget: \$145,039  
 FY2006: Proposed Budget: \$145,000  
 FY2007: Proposed Budget: \$145,000  
 FY2008: Proposed Budget: \$145,000

### **DMM 14: Residential Ultra-Low Flush Toilet Replacement Programs**

#### Corresponding BMP

- CUWCC BMP 14: Residential Ultra-Low-Flush Toilet Replacement Program

#### Description

In March 2006, the City implemented a residential ultra-low-flush toilet replacement rebate program. This program encourages the installation of ultra-low-flush toilets in older homes by offering a rebate for each replaced toilet. Up to a \$75 rebate is available from the City. The program requires a pre-inspection and may require a post-inspection. As of June 2007, the City has received over 300 applications and replaced over 600 toilets.

#### Implementation Schedule

- Residential Ultra-Low Flush Toilet Retrofit Program: On-going

Annual Budget/Expenditures

- FY2005: Actual Budget: \$0
- FY2006: Proposed Budget: \$17,400
- FY2007: Proposed Budget: \$87,000
- FY2008: Proposed Budget: \$180,000

**DETERMINATION OF DMM IMPLEMENTATION**

*10631. (f)(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.*

*10631. (f)(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.*

As discussed above, the City has been actively implementing the DMMs to the extent permissible by the City Charter, and as staffing and financial resources allow. In FY2005, the total budget for water conservation programs was \$540,465. This budget is projected to increase over the next few years as the City expands its water conservation programs.

Because the City's single-family residential water customers are not metered, individual water savings by single-family residential customer are not possible to determine. However, based on the City's annual water production, the City calculates its water conservation savings each month, by comparing current per capita water use to the previous year's per capita water use and 1985 per capita water use (a pre-drought year).

Figure 8-2 shows the estimated annual per capita water use for the last 19 years (1989 through 2007) indicating that per capita water consumption has varied somewhat over the last 19 years, but has averaged about 300 gallons per capita per day (gpcd). Figure 8-2 also shows that over the last five years per capita water use has decreased from 332 gpcd to 300 gpcd, and has been as low as 287 gpcd in 2006, which may be due to the City's expanded water conservation program over the last several years. It is anticipated that per capita water use may decrease even more in the future as the City implements its residential water meter program and customers become more aware of the water they actually use.

**EVALUATION OF DMMS NOT CURRENTLY IMPLEMENTED**

*10631 (g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation.*

As shown above in Table 8-1, the City currently has programs in place for most of the DMMS. The only DMMS which are not currently fully implemented are DMM 3 (System Water Audits, Leak Detection and Repair), DMM 4 (Metering With Commodity Rates for All New Connections and Retrofit of Existing Connections), DMM 9 (Conservation Programs for Commercial, Industrial, and Institutional Accounts), and DMM 11 (Conservation Pricing). However, as described in this chapter and as summarized below, each of these DMMS is scheduled for future implementation.

The only DMM not being implemented by the City is DMM 10 (Wholesale Agency Programs), as the City is not considered to be a wholesale water provider; as such, this DMM does not apply to the City.

**DMM 3 (System Water Audits, Leak Detection and Repair)**

Because the City is not currently fully metered, full implementation of DMM 3 is not possible at this time. The City’s distribution system operations staff, including permanent shift employees (weekends and after hours), respond to and repair any reported leaks as quickly as possible. The City has performed some leak detection pilot studies in small areas of the City and very few leaks have been found. A full water system audit and a more extensive leak detection program will be implemented once the City is fully metered.

**DMM 4 (Metering With Commodity Rates for All New Connections and Retrofit of Existing Connections) and DMM 11 (Conservation Pricing)**

Full implementation of DMMs 4 and DMM 11 have, until recently, been restricted by the City Charter, which prohibited metering of single-family residential connections. However, as discussed in DMM 4 above, SB 229 and AB 514, and the renewal of the City’s CVP Water Supply Contract, requires that all connections be metered and billed a metered rate by 2013. The City has developed a residential metering plan to install meters on all single-family residential connections. Implementation is scheduled to begin in 2008, with completion in 2013 (see implementation schedule provided in Appendix I). Implementation of this metering plan will meet the conditions of the CVP contract renewal, meet the requirements of SB 229 and AB 514, and fulfill the requirements of DMM 4 and DMM 11.

**DMM 9 (Conservation Programs for Commercial, Industrial, and Institutional Accounts)**

The City is requesting a position for a CII Water Conservation Representative. Once the position is authorized, the position will be filled to allow for CII water conservation activities to proceed.

As Table 8-6 indicates, there are no DMMs which are planned for non-implementation (with the exception of DMM 10 as described above which is not applicable to the City).

**Table 8-6. Non-Implemented Demand Management Measures (DWR Table 16)**

Non-Implemented Demand Management Measures	Reason
DMM 10: Wholesale Agency Programs	Not applicable to City as it is not considered to be a wholesale water provider

**POTENTIAL FUTURE DEMAND MANAGEMENT MEASURES**

As part of its efforts to increase water conservation within the City, the City Water Division is considering several other potential future water conservation measures. These potential future measures are summarized in Table 8-7.

It is unclear how much additional water could be saved as a result of these potential future water conservation methods, as it is unclear at this time how much funding will be available to implement the future programs and how many customers may participate. However, the City will strive to continue and improve its water conservation programs as the budget allows.

**Table 8-7. Potential Future Water Conservation Measures**

BMP/DMM Number	Measure Name	Proposed Implementation Date
BMP/DMM 1: Water Survey Programs for Single- and Multi-Family Residential	Xeriscape Landscape Rebate for New Homes	FY 2009/10
BMP/DMM 2: Residential Plumbing Retrofit	Retrofit Upon Resale Ordinance	2013
	Hot Water Recirculation System Rebate	FY 2008/09
BMP/DMM 3: System Water Audit, Leak Detection and Repair	Prioritized Leak Detection Program	2013
	Complete Water System Audit	2013
BMP/DMM 4: Metering with Commodity Rates	Residential Water Metering Program (see discussion above under Current and Planned Water Conservation Measures)	To start in 2008 and be completed by 2013
	Billing with Commodity Rates (see discussion above under Current and Planned Water Conservation Measures)	To start in 2010
BMP/DMM 5: Large Landscape Conservation Programs and Incentives	Programmable Irrigation Controller Rebate	FY 2008/09
	Weather-Based Irrigation Controller Rebate	FY 2009/10
	Turf Replacement Rebate	TBD
BMP/DMM 9: Conservation Programs for Commercial, Industrial and Institutional (CII) Accounts	CII Water Conservation Representative (Contract)	FY 2009/10
	Identification of Largest CII Water Users and Potential Water Conservation Measures	FY 2009/10
	CII Washing Machine Rebate Program	FY 2009/10
	CII Toilet Replacement Program	FY 2009/10
BMP/DMM 11: Conservation Pricing	Implementation of Tiered (Increasing Block) Water Rate Structure	After 2010
BMP/DMM 12: Water Conservation Coordinator	Join California Urban Water Conservation Council (CUWCC)	FY 2009/10 or sooner

# FRESNO CITY WATER COMPANY

CORNER H AND TULARE STREETS

H. G. KERNHOFF, PRES.  
A. C. CALCH, VICE PRES.  
B. C. WISDOM, GEN'L MGR.

FRESNO, CAL.

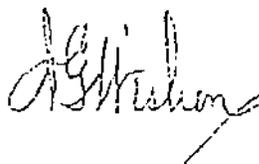
June 20, 1917

## Water Consumers:

In order that we may have ample pressure during the critical months of June, July and August for fire purposes and also for domestic use, all irrigation must be done with a sprinkler only, and not with an open butt hose, that has the effect of reducing the pressure in the locality where used. Use a sprinkler under pressure in any use of water through a hose.

We have inspectors out, checking up all water waste, and those who persist in the waste of water or persist in an offense against the Company's rules will be served through a meter only. We urgently ask for the kindly co-operation of the Company's consumers. The Fresno City Water Company is serving more water per capita than is served to any other city in America. We have at all times tried to be liberal with our service, but there is a limit beyond which we cannot and should not go in such service.

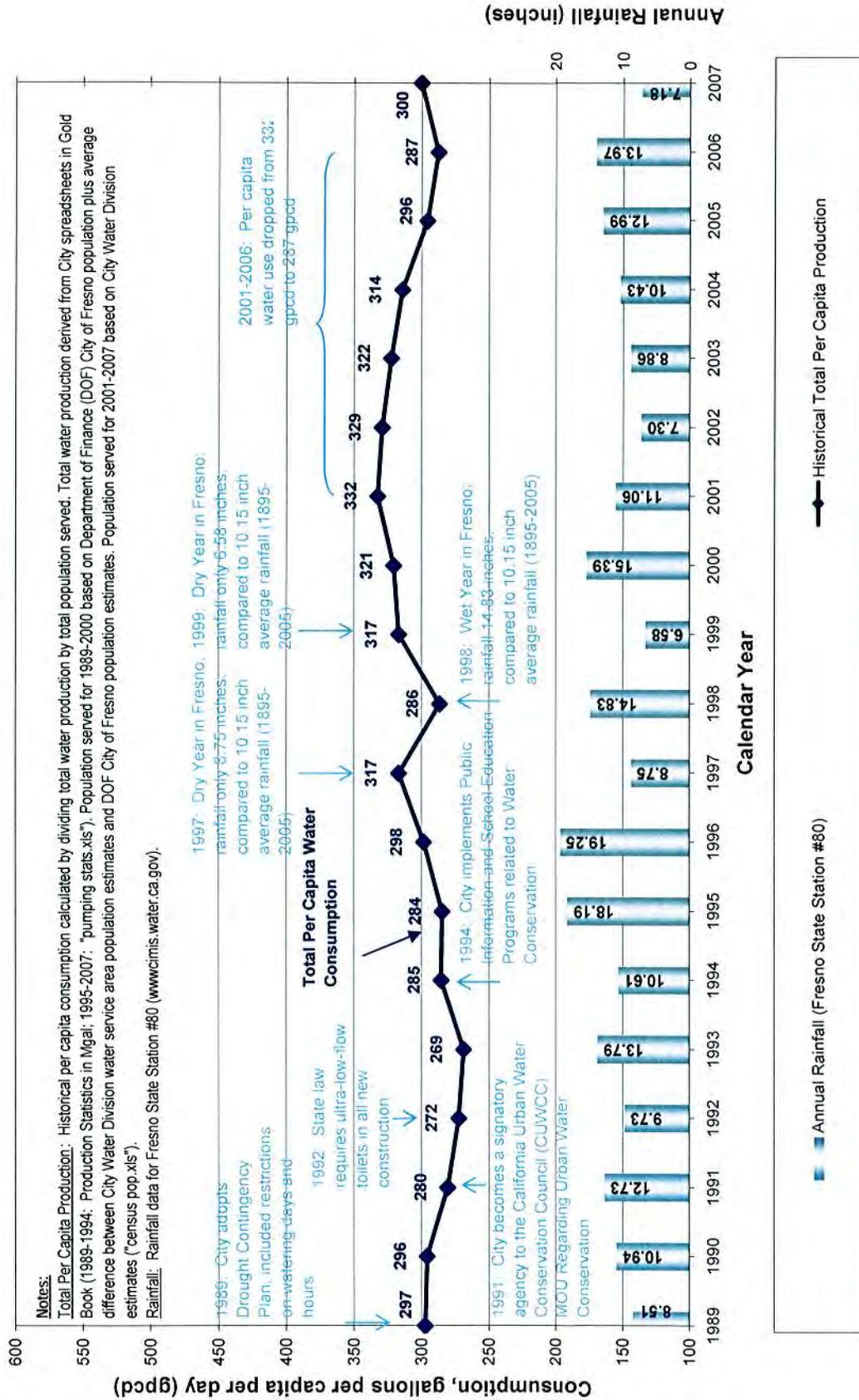
FRESNO CITY WATER COMPANY,



General Manager

AGW:EP2

**Figure 8-2. City of Fresno Historical Per Capita Water Consumption**



# CHAPTER 9. WATER SHORTAGE CONTINGENCY PLAN

10632. The plan shall provide an urban water shortage contingency plan analysis...

This chapter describes the City's Water Shortage Contingency Plan, including the following:

- Development and update of the City's Water Shortage Contingency Plan,
- Water conservation stages for water supply reductions up to 50 percent,
- Minimum water supply for the next three years based on the driest three-year historic period for the City,
- Actions to be taken during catastrophic interruption of water supplies,
- Mandatory prohibitions and consumption reduction methods,
- Penalties and charges for excessive use,
- Discussion of potential revenue and expenditure impacts,
- Draft Water Shortage Contingency Plan resolution, and
- Mechanisms for determining actual reductions in water use.

Appendix J of this UWMP contains a draft resolution which can be used to implement one or more stages of this Water Shortage Contingency Plan.

## PLAN DEVELOPMENT

### Previous Planning Efforts

Since 1989, the City has developed and adopted two plans in response to actual and potential water shortages:

- Drought Contingency Plan (adopted in 1989), and
- Water Shortage Contingency Plan (adopted in 1994).

The development of each of these plans is described below.

### Drought Contingency Plan

During the 1987 to 1992 California drought, the City experienced declining groundwater levels, requiring approximately 18 percent of the pumps in the City's wells to be lowered. Furthermore, the loss of about 20 percent of the total production capacity from wells out of service due to contaminants resulted in reduced water system pressures during peak demand periods. As a result, in June 1989, the City adopted a resolution declaring that an emergency existed which created an immediate threat of reduction in system pressures below the level needed to maintain minimum fire flows and meet domestic consumption needs.

The resolution implemented a Drought Contingency Plan, which established extraordinary measures to reduce water use. These emergency measures included immediate restrictions on outdoor watering days and hours. In 1990, these emergency measures were made permanent on a year-round basis and were the origin of the City's current summer and winter watering schedules. The measures, along with subsequent additions and updates, were incorporated into the City's Municipal Code (Section 6-520 Wastage of Water) and are discussed later in this chapter.

### 1994 Water Shortage Contingency Plan

The City's original Water Shortage Contingency Plan was developed by City staff in 1993 in response to the 1991 California Assembly Bill 11X (AB 11X) which amended the California Water Code and mandated that every urban water supplier providing municipal water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually develop a Water Shortage Contingency Plan. A public hearing was held on December 14, 1993 and the City's original Water Shortage Contingency Plan was adopted by City Council in January 1994.

Since the cities of Fresno and Clovis share the same groundwater aquifer, the development of the City's original Water Shortage Contingency Plan was coordinated with the City of Clovis. Also, the City's Emergency Response Plan was coordinated with the Fresno County Office of Emergency Services (OES), and water shortage planning was incorporated into the Fresno County Disaster Plan<sup>1</sup> (see further discussion later in this chapter under Planning for Catastrophic Water Supply Interruption).

### **Current Planning Effort**

This updated Water Shortage Contingency Plan, now a part of the City's UWMP, is based on the City's 1994 Water Shortage Contingency Plan. The overall structure of the plan has remained essentially the same, and includes updates and revisions to reflect the operational and policy changes which have occurred within the City's water system since 1994. In particular, the City now has a mutual aid water system agreement in place with the City of Clovis which includes the provision of two future interties between the Fresno and Clovis water systems for use by either or both agencies during emergencies.

## **STAGES OF ACTION FOR WATER USE REDUCTION**

*10632 (a) 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 which are applicable to each stage.*

### **Water Use Reduction Plan**

One of the key elements of the Water Shortage Contingency Plan is a staged Water Use Reduction Plan (Reduction Plan). The City's 1994 Water Shortage Contingency Plan had a

---

<sup>1</sup> Source: City of Fresno Water Shortage Contingency Plan, January 1994.

three-stage Reduction Plan. For this updated Water Shortage Contingency Plan, four stages have been established to provide for increased flexibility to address water supply shortage conditions of up to 50 percent (see Table 9-1).

**Table 9-1. City of Fresno Water Supply Shortage Stages and Conditions (DWR Table 23)**

Stage	Shortage Condition	Demand Reduction Goal	Program Type
1	Minimal Shortage: Up to 10 percent	10 percent	Voluntary
2	Moderate Shortage: 10 to 25 percent	25 percent	Mandatory
3	Severe Shortage: 25 to 35 percent	35 percent	Mandatory
4	Critical Shortage: 35 to 50 percent	50 percent	Mandatory

### Water Use Reduction Plan Triggers

Each stage of the Reduction Plan is generally triggered by a water shortage condition. The City has a legal responsibility to provide for the health and safety water needs of the community. To minimize the social and economic impact of water shortages, the City will manage its water supplies prudently.

It should be noted that a water shortage may trigger any stage of the Reduction Plan at any time, and that the City will determine the most appropriate stage to implement based on the actual conditions at the time of the shortage/emergency. The conditions that may trigger specific stages of the City’s Reduction Plan are shown in Table 9-2. Water reduction stages may be triggered by any one or a combination of the listed conditions if they result in a loss, or impending loss, of water supply or production capacity. Stage 1 of the Reduction Plan will be triggered when it is anticipated that there will be up to a 10 percent reduction in the City’s water supply or production capacity or a key Stage 1 trigger occurs. Under this stage, the City will request customers to voluntarily reduce water consumption by 10 percent, and will enact additional specific water use restrictions (see discussion below and draft resolution in Appendix J). Subsequent Reduction Plan stages will be implemented if additional water supply or production capacity reductions occur and will include enactment of additional specific water use restrictions (see discussion below). Successive stages of the Reduction Plan will be declared only after exhausting efforts to make a prior stage successful. In general, Stage 2 will be triggered by a reduction of water supply or production capacity up to 25 percent (or a key Stage 2 trigger occurs); Stage 3 will be triggered by a reduction of water supply or production capacity up to 35 percent (or a key Stage 3 trigger occurs); and Stage 4 will be triggered by a reduction of water supplies up to 50 percent (or a key Stage 4 trigger occurs), and will include enactment of additional specific water use restrictions (see discussion below).

In some cases it may be necessary for the City to immediately implement an advanced stage of the Reduction Plan. This may occur during a natural disaster or when the health and safety of the persons within the City’s water service area are jeopardized. The Reduction Plan and its stages are designed to be flexible so that the City can respond to the specific water supply situation occurring at a particular time.

Table 9-2. Water Use Reduction Plan Triggering Mechanisms<sup>(a)</sup>

Stage	Shortage Condition	Demand Reduction Goal	Possible Triggering Mechanisms <sup>(b)</sup>
1	Up to 10%	10%	<ul style="list-style-type: none"> <li>In the second of two consecutive years, the projected volume of surface water available to the City through USBR and FID is projected to be less than the long-term average, and the reduction in supply, averaged over the consecutive years, is equal to 10% or greater.</li> <li>Groundwater contamination condition exists (DHS requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 10% loss in water production capacity, or</li> <li>Localized groundwater cones of depression develop, and to avoid possible litigation, City must shut down existing wells that result in a 10% loss in groundwater production capacity, or</li> <li>A combination of the above mentioned circumstances or a disaster reduces the City's overall water supply or production capabilities by 10% or more</li> </ul> <p>After having been in a Stage 2 classification, the following water year results in a declaration by the USBR of normal or above normal water deliveries on the Front-Kern system, or the original trigger for conditions for this stage</p>
2	10 to 25%	25%	<ul style="list-style-type: none"> <li>In the third of three consecutive years, the projected volume of surface water available to the City through USBR, FID or other means such as water banking, is less than the long term average, and the reduction in supply, averaged over the three consecutive years equals 10% or greater, or</li> <li>The volume of surface water available to the City through FID plus water available through other means such as water banking, is reduced by 25% of the long-term average, or</li> <li>The volume of surface water available to the City through USBR plus water available through other means such as water banking, is reduced by 25% of the long-term average, or</li> <li>One-year change in average groundwater level in 30 key City wells exceeds 6 feet, or</li> <li>Groundwater contamination condition exists (DHS requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 25% loss in water production capacity, or</li> <li>A combination of the above mentioned circumstances or disaster reduces the City's overall water supply or production capabilities by 25% or more</li> </ul> <p>After having been in a Stage 3 classification, the following water year results in a declaration by the USBR of normal or above normal water deliveries on the Front-Kern system, or the original trigger for conditions for this stage</p>
3	25 to 35%	35%	<ul style="list-style-type: none"> <li>In the fourth of four consecutive years, the projected volume of surface water available to the City through USBR, FID or other means such as water banking, is less than the long term average, and the reduction in supply, averaged over the four consecutive years equals 10% or greater, or</li> <li>The volume of surface water available to the City through FID plus water available through other means such as water banking, is reduced by 35% of the long-term average, or</li> <li>The volume of surface water available to the City through USBR plus water available through other means such as water banking, is reduced by 35% of the long-term average, or</li> <li>One-year change in average groundwater level in 30 key City wells exceeds 5 feet or two-year change in average groundwater level in 30 key City wells exceeds 10 feet, or</li> <li>Groundwater contamination condition exists (DHS requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 35% loss in water production capacity, or</li> <li>A combination of the above mentioned circumstances or disaster reduces the City's overall water supply or production capabilities by 35% or more</li> </ul> <p>After having been in a Stage 4 classification, the following water year results in a declaration by the USBR of normal or above normal water deliveries on the Front-Kern system, or the original trigger for conditions for this stage</p>
4	35 to 50%	50%	<ul style="list-style-type: none"> <li>In the fifth of five consecutive years, the projected volume of surface water available to the City through USBR, FID or other means such as water banking, is less than the long term average, and the reduction in supply, averaged over the five consecutive years equals 10% or greater, or</li> <li>The volume of surface water available to the City through FID plus water available through other means such as water banking, is reduced by 50% of the long-term average, or</li> <li>The volume of surface water available to the City through USBR plus water available through other means such as water banking, is reduced by 50% of the long-term average, or</li> <li>One-year change in average groundwater level in 30 key wells exceeds 7 feet or two-year change in average groundwater level in 30 key City wells exceeds 12 feet, or</li> <li>Groundwater contamination condition exists (DHS requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 50% loss in water production capacity, or</li> <li>A combination of the above mentioned circumstances or disaster reduces the City's overall water supply or production capabilities by 50% or more</li> </ul> <p>Based on revisions to triggers contained in the January 1994 City of Fresno Water Shortage Contingency Plan (a) Water reduction stages may be triggered by any one or a combination of the listed conditions, if they result in a loss, or impending loss, of water supply or production capacity as defined by the shortage condition.</p>

The Reduction Plan presented herein is not intended to be construed as a binding legal document, but rather a comprehensive summary of water use reduction criteria that are built upon City Municipal Code and ordinances, DWR references, and common water industry practices. During a future drought or other water supply shortage, the draft resolution contained in Appendix I may be used as a model for the enactment of appropriate restrictions.

## ESTIMATED MINIMUM WATER SUPPLY FOR NEXT THREE YEARS

*10632 (b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historical sequence for the agency's water supply.*

As discussed in Chapter 4, the City currently has the following sources of supply:

- Surface water from FID (Kings River),
- Surface water from the USBR (CVP),
- Previously recharged surface water supply, available through the City's groundwater recharge activities, and
- Groundwater supply.

The driest historical three-year period was 1987, 1988 and 1989, at the beginning of the 1987 to 1992 drought. Based on the 2006 Settlement Agreement, these three years were classified as dry or normal-dry. However, for purposes of this evaluation, it has been assumed that the minimum water supply for the next three years is based on three consecutive years with critical low water supply conditions. As described in Chapter 4, under these conditions, surface water deliveries from FID and USBR would be reduced significantly. Under these conditions, groundwater is anticipated to be available to make up for the loss in surface water supplies. Table 9-3 presents the estimated minimum water supply for the next three years.

Also shown in Table 9-3 are the projected demands for the next three years (see Chapter 6). For these assumed hydrologic conditions (critically dry years), demands have been assumed to be reduced by increasing percentages, from 15 to 25 percent, for the three-year period based on mandated water conservation measures to be implemented during dry year conditions. These demand projections do not include the additional water conservation recommended as part of the City's future water supply plan. Implementation of the Water Shortage Contingency Plan may, in fact, result in additional savings, thus further reducing the water demand. However, based on the assumed minimum useable supplies and reduced water demand, shortages would occur in each of the next three years based on the assumed historic hydrologic conditions. Based on current operations, the estimated shortage in supply would be met using groundwater from storage, as reflected in the change in groundwater basin storage shown in Table 9-3. As discussed in Chapter 4, in the future, the City may consider additional facilities that could enable the City to utilize more surface water and eliminate the need to use groundwater basin storage to meet demands.

**Table 9-3. Estimated Minimum Water Supply for the Next Three Years (DWR Table 24)**

Supply Source	Projected Minimum Water Supply, acre-feet		
	2008	2009	2010
Assumed Hydrologic Classification	Critical-low	Critical-low	Critical-low
Available Supplies <sup>(a)</sup>			
Surface Water			
FID (Kings River)	48,640	48,920	49,200
USBR (CVP)	13,900	13,900	13,900
<u>Recharge (Recycled)</u>	<u>13,800</u>	<u>13,800</u>	<u>13,800</u>
Total Surface Water	76,340	76,620	76,900
Groundwater			
Natural Recharge	24,600	24,800	25,100
<u>Subsurface Inflow</u>	<u>25,500</u>	<u>24,000</u>	<u>22,500</u>
Total Groundwater	50,100	48,800	47,600
Total Available Supplies	126,400	125,420	124,500
Useable Supplies <sup>(a)</sup>			
Surface Water			
Surface Water Treatment Facility	30,800	30,800	30,800
<u>Recharge &amp; Extracted<sup>(b)</sup></u>	<u>38,100</u>	<u>38,100</u>	<u>43,100</u>
Total Surface Water	68,900	68,900	73,900
Groundwater			
Natural Recharge	24,600	24,800	25,100
<u>Subsurface Inflow</u>	<u>25,500</u>	<u>24,000</u>	<u>22,500</u>
Total Groundwater	50,100	48,800	47,600
Total Useable Supplies	119,000	117,700	121,500
Total Water Demand <sup>(c)</sup>	166,180	169,040	171,900
Assumed Mandatory Water Conservation Savings <sup>(d)</sup>	15%	20%	25%
Reduced Water Demand	141,250	135,230	128,900
Supply Shortage/Change in GW Basin Storage <sup>(e)</sup>	(22,250)	(17,530)	(7,400)

(a) Available and useable supplies derived from Fresno Metro Plan Update Phase 1 Report dated December 2007 (Table 5-16). See Chapter 4 for discussion of available supplies vs. useable supplies.

(b) Intentional recharge with surface water was 38,100 af in 2007. The City's future water supply plan includes an increase in intentional recharge (see Table 4-13).

(c) See Chapter 6 for discussion of water demand. Does not include additional water conservation as recommended as part of the City's future water supply plan.

(d) Demand in critically dry years assumed to be 75 to 85 percent of normal (15 to 25 percent reduction).

(e) Based on current operations, assumes that the City will utilize groundwater basin storage to meet demands. Based on the 1992 Metro Plan, the total groundwater storage in the Fresno/Clovis Metropolitan Area was estimated to be 2 million acre-feet. Therefore, the change in groundwater storage shown in Year 1 above represents approximately a 1.1 percent decrease in groundwater storage. Year 2 and 3 changes in groundwater storage represent 0.9 percent and 0.4 percent decreases in groundwater storage, respectively.

**PLANNING FOR CATASTROPHIC WATER SUPPLY INTERRUPTION**

10632 (c) 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.

In addition to responding to drought conditions, the City’s Water Shortage Contingency Plan can be used to respond to emergency or catastrophic conditions that impact the availability of the City’s water supplies, and/or the ability to deliver water within the City’s service area. Potential events are listed in Table 9-4 and are described below.

**Table 9-4. Potential Emergency Events and Summary of Possible Actions (DWR Table 25)**

Potential Emergency Events	Possible Cause of Event	Summary of Possible Actions
Loss of Surface Water Supply	<ul style="list-style-type: none"> <li>• Surface water contamination</li> <li>• Water treatment facility shutdown (i.e., process failure, mechanical malfunction)</li> <li>• Major transmission pipeline break</li> </ul>	<ul style="list-style-type: none"> <li>• Use of groundwater supply, and/or</li> <li>• Activate interties with City of Clovis per Fresno/Clovis Mutual Aid Water System Agreement as appropriate, and/or</li> <li>• If necessary, implement Water Shortage Contingency Plan to reduce demands</li> </ul>
Loss of Groundwater Supply	<ul style="list-style-type: none"> <li>• Groundwater contamination</li> </ul>	<ul style="list-style-type: none"> <li>• Use of other wells and/or treated surface water supply to meet demands, and/or</li> <li>• Activate interties with City of Clovis per Fresno/Clovis Mutual Aid Water System Agreement as appropriate, and/or</li> <li>• If necessary, implement Water Shortage Contingency Plan to reduce demands</li> </ul>
Area-Wide Electrical Power Failure	<ul style="list-style-type: none"> <li>• Regional power outage</li> </ul>	<ul style="list-style-type: none"> <li>• Use of wells equipped with emergency back-up generators to meet demands of critical facilities, and/or</li> <li>• Activate interties with City of Clovis per Fresno/Clovis Mutual Aid Water System Agreement as appropriate, and/or</li> <li>• If necessary, implement Water Shortage Contingency Plan to reduce demands</li> </ul>
Earthquake	<ul style="list-style-type: none"> <li>• Natural disaster</li> </ul>	<ul style="list-style-type: none"> <li>• Isolate pipeline breaks and repair as quickly as possible, and/or</li> <li>• Activate interties with City of Clovis per Fresno/Clovis Mutual Aid Water System Agreement as appropriate, and/or</li> <li>• Obtain emergency potable supplies from Bakman Water Company per Water Division Emergency Response Plan, and/or</li> <li>• If necessary, implement Water Shortage Contingency Plan to reduce demands</li> </ul>
Flood	<ul style="list-style-type: none"> <li>• Natural disaster</li> </ul>	<ul style="list-style-type: none"> <li>• Isolate impacted portions of system to allow for repair as quickly as possible, and/or</li> <li>• Activate interties with City of Clovis per Fresno/Clovis Mutual Aid Water System Agreement as appropriate, and/or</li> <li>• If necessary, implement Water Shortage Contingency Plan to reduce demands</li> </ul>

Actions that the City would take if these emergencies occurred today are outlined below.

### **Loss of Surface Water Supply**

The surface water that the City obtains from the Bureau and FID is potentially subject to contamination as a result of a chemical or other contaminant spill or other event near the canals that convey surface water to the City's surface water treatment facility. Also, the surface water treatment facility and/or transmission mains leading to or from the surface water treatment facility are potentially subject to shutdown due to process malfunction, mechanical failure, or pipeline breakage. If any of these events were to occur, the City could potentially lose its surface water supply for a period of time.

Under this scenario, depending on the time of year and the water demands at the time of the event, the City may be able to meet demands with minimal impacts to the overall system, or may need to increase groundwater production and/or implement the Water Shortage Contingency Plan to reduce water demands until the surface water supply can be restored. In the future, if appropriate, another alternative may be to activate one or both of the proposed interties to the Clovis water system per the Fresno/Clovis Mutual Aid Water System Agreement.

In the future, if the City decides to construct a second surface water treatment facility, this second facility would provide additional system redundancy, minimizing the impact of a process malfunction or failure at one of the surface water treatment facilities.

### **Loss of Groundwater Supply**

Recently the City has experienced loss of groundwater production in the northwest and southeast areas of the City due to groundwater contamination in the underlying aquifer. Although this loss in production has been gradual, if the trend continues, the City will either need to replace lost groundwater production with new wells in non-contaminated areas, or increase its surface water treatment capacity to allow for the increased use of treated surface water supplies. Because the installation of new wells and/or the construction of a new water treatment facility will take time, the City may need to implement one or more stages of the Water Shortage Contingency Plan in order to reduce water demands until the loss in groundwater production can be mitigated. In the future, if appropriate, another alternative may be to activate one or both of the proposed interties to the Clovis system per the Fresno/Clovis Mutual Aid Water System Agreement.

### **Area-Wide Electrical Power Failure**

If an area-wide/regional electrical power failure were to occur within the City's water service area, the City plans to maintain emergency levels of well production, especially near critical care facilities, and maintain a minimum of 20 psi within the distribution system through the use of emergency generators located at key well sites. Currently, thirty (30) of the City's wells have back-up power provisions: twenty-seven (27) have diesel-fired generators and three (3) have natural gas-fired generators<sup>2</sup>. The City is currently in the process of planning for emergency backup power provisions at ten (10) additional well sites and is planning to conduct a study to

---

<sup>2</sup> Source: City of Fresno Water Division Emergency Response Plan, September 2003.

determine the feasibility of installing an emergency generator at the surface water treatment facility. None of the City's booster pump stations are currently equipped with emergency backup generators.<sup>3</sup>

If the regional power failure were to last for a prolonged period of time (i.e., more than 24 hours), it may be necessary to implement one or more stages of the Water Shortage Contingency Plan in order to reduce system water demands and ensure that adequate system pressures can be maintained to meet fire fighting and other critical health and safety water demands during the power outage. In the future, if appropriate, another alternative may be to activate one or both of the proposed interties to the Clovis system per the Fresno/Clovis Mutual Aid Water System Agreement.

### **Earthquake**

There are a number of active and potentially active faults within and adjacent to the City. Although the City is situated in an area of relatively low seismic activity by comparison to other areas of the state, the faults and fault systems that lie along the western boundaries of Fresno County, as well as other regional faults, have the potential to produce high-magnitude earthquakes throughout the county and in the City<sup>4</sup>.

Water system infrastructure, including water treatment facilities, wells, pump stations, storage tanks, and pipelines, can be damaged during a strong earthquake. The City's facilities have been constructed in accordance with the applicable building codes to minimize potential damage during an earthquake. However, it is expected that some facilities may be damaged as the result of a strong earthquake.

In addition to the City's surface water treatment facility, the City has approximately 250 groundwater wells located throughout the distribution system. These numerous supply points within the distribution system, along with looped distribution pipelines, will allow potentially damaged portions of the City's system to be quickly isolated, by-passed and repaired, while maintaining service in non-damaged areas.

Also, two future interties with the City of Clovis are planned based on the Fresno/Clovis Mutual Aid Water System Agreement. In the Water Division Emergency Response Plan, the City has also identified the Bakman Water Company as a potential potable water supply sources in the event of an emergency. Temporary piping connecting the systems would be necessary to provide pressurized water to the City's distribution system. Also, several drinking water companies (e.g., Alhambra, Arrowhead) have been identified as emergency potable water supply sources.

In the future, if the City constructs a second water treatment facility, this second facility would provide some additional system redundancy, minimizing the impact of a shutdown of one of the

---

<sup>3</sup> Source: Brock Buche, City of Fresno Water Division, e-mail regarding City wells and booster stations, June 5, 2006. The City has decided that since the booster pump stations do not produce water (they only move water), they are a lower priority for backup power provisions.

<sup>4</sup> Source: Fresno County General Plan, October 2000.

water treatment facilities or loss of groundwater production capacity as a result of earthquake damage.

After an earthquake, it may be necessary to implement one or more stages of the Water Shortage Contingency Plan to reduce system water demands to ensure that adequate system pressures can be maintained to meet fire fighting and other critical health and safety water demands during the immediate period after an earthquake, and as facilities are restored to full operation.

In the future, if appropriate, another alternative may be to activate one or both of the proposed interties to the Clovis system per the Fresno/Clovis Mutual Aid Water System Agreement.

## **Flood**

Since its beginning as Fresno Station in 1872, and before construction of the flood control and urban drainage system, Downtown Fresno has regularly experienced flooding. The Fresno Metropolitan Flood Control District (FMFCD) was created in 1956 for the purpose of protecting lives and property in the Fresno-Clovis metropolitan area. FMFCD oversees the north-central portion of Fresno County, between the San Joaquin and Kings Rivers, and is authorized to control storm waters within an urban and foothill watershed of approximately 400 square miles. This area includes most of the Fresno-Clovis metropolitan area, and unincorporated lands to the east and northeast. Flood control facilities within the City of Fresno include numerous storm water retention basins, along with a system of storm water inlets, siphons, underground pipelines and pump stations.<sup>5</sup>

As with an earthquake, water system infrastructure, including water treatment facilities, wells, pump stations, storage tanks, and pipelines, can be damaged or rendered inoperable during a flood. Although the FMFCD has constructed facilities to control flooding within the City, localized flooding may occur in portions of the City as a result of large storms or even ruptured water mains. If such an event were to occur, it is expected that some facilities may be damaged or rendered inoperable.

In addition to the City's surface water treatment facility, the City's has approximately 250 groundwater wells located throughout the distribution system. These numerous supply points within the distribution system, along with looped distribution pipelines, will allow potentially damaged or inoperable portions of the City's system to be quickly isolated, by-passed and repaired, while maintaining service at least at minimal levels in non-damaged or non-impacted areas.

After a flood, it may be necessary to implement one or more stages of the Water Shortage Contingency Plan to reduce system water demands to ensure that adequate system pressures can be maintained to meet fire fighting and other critical health and safety water demands during the immediate period after a flood has occurred, and as facilities are restored to full operation.

In the future, if appropriate, another alternative may be to activate one or both of the proposed interties to the Clovis system per the Fresno/Clovis Mutual Aid Water System Agreement.

---

<sup>5</sup> Source: Fresno Metropolitan Flood Control District website, [www.fresnofloodcontrol.org](http://www.fresnofloodcontrol.org).

## WATER USE PRIORITIES DURING WATER SHORTAGE EMERGENCIES

The City has established priorities for the use of available water, based on guidance from the California Water Code (Chapter 3. Water Shortage Emergencies) and community input<sup>6</sup>. The priorities, in order of importance, are:

1. Health & Safety: Interior residential (domestic and sanitation) and fire fighting
2. Commercial, Industrial & Governmental: Maintain jobs and economic base
3. Existing Landscaping: Especially trees and shrubs
4. New Demand: Projects without permits when a water shortage is declared

## MANDATORY PROHIBITIONS AND RESTRICTIONS

*10632 (d) 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.*

The City Municipal Code contains a section on the wastage of water and water conservation measures (Section 6-520 Wastage of Water), which outlines the mandatory prohibitions and restrictions that are in place under normal water supply conditions in the City. These measures include the following regulations and restrictions.

- Outdoor watering schedule:
  - Winter Watering Schedule: December 1 – March 1
    - Odd Numbered Addresses: Saturdays Only
    - Even Numbered Addresses: Sundays Only
    - Watering Times: Anytime
  - Summer Watering Schedule: March 2 – November 30
    - Odd Numbered Addresses: Tuesdays, Thursdays, Saturdays Only
    - Even Numbered Addresses: Wednesdays, Fridays, Sundays Only
    - Watering Times: 8:00 am – 11:00 am; 7:00 pm – 6:00 am
    - No Watering between 6:00 am – 8:00 am; 11:00 am – 7:00 pm
  - No watering on Mondays
- Installation of blue grass and rye grass is prohibited.
- Watering any lawn except by use of a hose held in the person's hand or a sprinkling device is prohibited.
- Keeping, maintaining, operating, or using any water connection, hose, faucet, hydrant, pipe, outlet, or plumbing fixture which is not tight and free from leakage is prohibited.

<sup>6</sup> Source: City of Fresno Water Shortage Contingency Plan, January 1994.

- Willfully or negligently wasting water is prohibited.
- Flooding any part of the premises of another is prohibited.
- Sprinkling the premises of another so as to prevent the normal use thereof or unreasonably wet objects thereon which should not be subjected to a spray of water except as naturally caused by the elements or by action of the owner of the object is prohibited.
- Sprinkling or irrigating any yard, ground, premise, or vegetation unless the watering device is controlled by an automatic shut-off device, or a person is in immediate attendance of the hose or watering device is prohibited.
- Washing any privately owned motor vehicle, trailer, or boat except from a bucket or in a commercial car wash, provided a hose equipped with a shut-off nozzle may be used for a quick rinse, is prohibited.
- Washing or rinsing with a hose or watering device any sidewalk, driveway, parking area, tennis court, patio, or any other exterior paved area, except in a manner which prevents the bulk of the runoff water from entering the street and instead diverts such water to other productive purposes such as landscape irrigation is prohibited.
- Lawn sprinkling system/devices shall be properly designed, installed, maintained and operated to prevent wastage of water.
- Installing or replacing air-conditioning systems (including portable systems) without a water conservation device which is properly maintained is prohibited.
- The draining of swimming pools more than once every three years, except for structural damage or cyanuric acid level over 100 parts per million, total dissolved solids over 2,500 parts per million, or calcium over 450 parts per million is prohibited. A permit is required to drain a swimming pool.

Table 9-5 lists the additional conservation measures associated with each Water Use Reduction Plan stage which would further restrict the allowable water uses and landscape irrigation practices during a water shortage condition. It should be noted that the actions included in each stage are cumulative, meaning that if Stage 2 is implemented, all of the measures in Stages 1 and 2 shall be implemented. If Stage 3 is implemented, all of the measures in Stages 1, 2 and 3 shall be implemented. If Stage 4 is implemented, all of the measures in Stages 1, 2, 3 and 4 shall be implemented.

Another potential mechanism used by some water utilities to conserve water use is to lower overall distribution system pressures slightly, say by 5 psi, to minimize leaks and water waste. The City can reduce system pressures City-wide using their SCADA system to change zone pressure settings.

Table 9-5. Mandatory Prohibitions and Water Use Restrictions for City of Fresno Water Shortage Contingency Plan (DWR Table 26)

Stage	Water Use Reduction Goal	City Actions/Additional Restrictions and Prohibitions
1	10%	<ul style="list-style-type: none"> <li>Initiate a public information program/media campaign to:</li> <li>Notify all customers of the water shortage and the need to conserve water</li> <li>Mail information to every customer explaining the importance of significant water use reductions</li> <li>Provide practical information to customers on ways to improve water use efficiency</li> <li>Publicize and expand the toilet retrofit and other efficiency programs</li> <li>Request customers to voluntarily reduce their water use by 10 percent</li> <li>Increase its water waste patrols to enforce the provisions of the Fresno Municipal Code Section 6-520 Wastage of Water</li> </ul>
2	25%	<ul style="list-style-type: none"> <li>The City of Fresno shall:</li> <li>Intensify its public information program and media campaign</li> <li>Further increase water waste patrols</li> <li>Adopt additional ordinances to:</li> <li>Limit summer outdoor irrigation to 2 days/week with reduced watering times for allow only irrigation of trees and shrubs, but not turf]</li> <li>Prohibit winter outdoor irrigation</li> <li>Allow car washing with bucket only (a hose equipped with a shut-off nozzle may be used for a quick rinse)</li> </ul>
3	35%	<ul style="list-style-type: none"> <li>The City of Fresno shall:</li> <li>Continue its intensified public information program and media campaign</li> <li>Intensify its leak detection program</li> <li>Adopt additional ordinances to:</li> <li>Limit summer outdoor irrigation to 1 day/week with reduced watering times for allow only irrigation of trees and shrubs, but not turf]</li> <li>Prohibit winter outdoor irrigation</li> <li>Allow car washing with bucket only (a hose equipped with a shut-off nozzle may be used for a quick rinse)</li> <li>Implement Stage 3 water consumption allocations for all customers (see Table 9-8)</li> <li>Not issue building permits or install meters for new accounts which had not received building permits before the water shortage emergency declaration [or continue to allow building permits, but do not allow new landscaping to be installed]</li> </ul>
4	50%	<ul style="list-style-type: none"> <li>The City of Fresno shall:</li> <li>Continue its intensified public information program and media campaign</li> <li>Adopt additional ordinances to:</li> <li>Prohibit all outdoor irrigation</li> <li>No restaurant, hotel, cafe, cafeteria or other public place where food is sold, served, or offered for sale, shall serve drinking water to any customer unless expressly requested</li> <li>Prohibit use of potable water to clean, fill or maintain decorative fountains, lakes or ponds unless such water is reclaimed</li> <li>Prohibit use of potable water for construction, compaction, dust control, street or parking lot sweeping, building wash down where non-potable or recycled water is sufficient</li> <li>Prohibit use of potable water for sewer system maintenance or fire protection training without prior approval by the City Manager</li> <li>Prohibit use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except where necessary for public health or safety</li> <li>Prohibit allowing potable water to escape from breaks within the customer's plumbing system for more than twenty-four (24) hours after the customer is notified or discovers the break</li> <li>Prohibit washing cars, boats, trailers, aircraft, or other vehicles except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment</li> <li>Require covers for swimming pools when not in use</li> <li>Prohibit use of outdoor misters</li> <li>Implement Stage 4 water consumption allocations for all customers (see Table 9-8)</li> </ul>

## CONSUMPTION REDUCTION METHODS

*10632 (e) Consumption reduction methods in the more 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.*

### Per Capita Health and Safety Allotments Used in 1994 Plan

The City's previous Water Shortage Contingency Plan included Residential Per Capita Health and Safety Water Use Allotments for the most restrictive stages of the Water Shortage Contingency Plan. These Residential Health and Safety Water Use Allotments were based on calculated minimum domestic water uses, including toilet flushing, showering, clothes washing, and kitchen and other uses. These calculated allotments equated to 50 to 68 gallons per capita per day (gpcd), which is equivalent to a water allotment of about 26 to 35 percent of the 2006 per capita residential water use of 192 gpcd. While these calculated allotments represent theoretical minimum domestic water use, they are not based on actual water use data for the City's residents, are extremely low and difficult to track, as most of the City's residential customers are not metered, and likely would not be achievable during a water shortage emergency.

### Estimated Residential Wintertime Water Use

For this update of the City's Water Shortage Contingency Plan, actual water use data for residential wintertime water use (e.g. January and February) has been utilized to calculate residential water use allotments for the most restrictive stages of the Water Shortage Contingency Plan. Wintertime water use is considered to be more representative of actual minimum domestic water use because it consists primarily of indoor domestic uses, as exterior water use is likely to be minimal during the months of January and February.

As shown in Table 9-6, metered multi-family residential water use data for the months of January and February plus estimates of unmetered single-family residential water use for the months of January and February were evaluated for the last several years (2003 through 2006). The winter-time water use was found to range from about 93 gpcd to 124 gpcd. These wintertime water uses are about 47 to 54 percent of the average annual per capita residential water use and more typical of what one would expect for interior wintertime use.

**Table 9-6. Estimated Residential Wintertime Water Use**

Year	Population Served <sup>(a)</sup>	Total Annual Residential Water Use, af <sup>(b)</sup>	Average Annual Residential Water Use Per Person, gpcd	Wintertime (January/February) Residential Water use, af <sup>(b)</sup>	Average Wintertime (January/February) Residential Water Use Per Person, gpcd	Percent of Annual Average Residential Per Capita Water Use
2003	457,511	116,747	228	10,288	124	54%
2004	466,203	110,667	212	9,619	114	54%
2005	475,061	105,398	198	8,024	93	47%
2006	484,087	103,217	192	8,579	98	51%
Average			208		107	51%

<sup>(a)</sup> As estimated by the City Water Division.

<sup>(b)</sup> Estimated based on metered annual multi-family residential water use and estimated unmetered annual single-family residential water use (see Table 6-3).

Based on this analysis, for Stage 3, a water use allotment equal to 110 percent of the average wintertime (January/February) residential water use is proposed for single-family and multi-family accounts. For Stage 4, a water use allotment equal to 95 percent of the average wintertime (January/February) residential water use is proposed for single-family and multi-family accounts. These residential water use allotments are based on meeting the required demand reductions for Stages 3 and 4 of the Water Shortage Contingency Plan and are summarized in Table 9-7.

**Table 9-7. Residential Water Use Allotments For Stage 3 and 4 Water Shortages**

Customer/Connection Type	Stage 3 Allotment	Stage 4 Allotment
Residential	110% of Average Wintertime (January/February) Usage	95% of Average Wintertime (January/February) Usage

As shown in Table 9-7, the residential allotment for Stage 4 is only 95 percent of average wintertime use. However, severe water conservation measures must be implemented by all to achieve the overall Stage 4 water demand reduction goal of 50 percent.

**Non-Residential Water Use Allotments**

Similar to the 1994 Water Shortage Contingency Plan, allotments have also been determined by the City for non-residential customers for the most restrictive stages of the Water Shortage Contingency Plan. Like the residential allotments, these allotments have been determined based on review of historical water use data, particularly wintertime water use, and required water use reductions to achieve the overall water use reduction goals of 35 percent and 50 percent, respectively, for Stages 3 and 4 of the Water Shortage Contingency Plan in conjunction with the residential allocations described above. These allotments are as follows:

- Commercial/institutional customers:
  - Stage 3: 85 percent of normal average (non-shortage) annual usage
  - Stage 4: 65 percent of normal average (non-shortage) annual usage
- Industrial customers:
  - Stage 3: 85 percent of normal average (non-shortage) annual usage
  - Stage 4: 75 percent of normal average (non-shortage) annual usage
- Landscape irrigation customers:
  - Stage 3: 50 percent of normal average (non-shortage) annual usage
  - Stage 4: 0 percent of normal average (non-shortage) annual usage

The proposed allotments for commercial/institutional, industrial and landscape irrigation customers for Stages 3 and 4 are summarized in Table 9-8.

**Table 9-8. Proposed Non-Residential Water Use Allotments for Stage 3 and 4 Water Shortages**

Customer/Connection Type	Stage 3 Allotment <sup>(a)</sup>	Stage 4 Allotment <sup>(a)</sup>
Commercial/Institutional	85% of Average Annual Usage	65% of Average Annual Usage
Industrial	85% of Average Annual Usage	75% of Average Annual Usage
Landscape Irrigation	50% of Average Annual Usage	0% of Average Annual Usage

<sup>(a)</sup> Allotments based on required demand reduction to achieve overall demand reduction of 35 percent and 50 percent for Stages 3 and 4, respectively.

Similar to Stage 4 residential allotments, the non-residential allotments for Stage 4 are quite low as compared to average annual use, and are actually somewhat lower (about 5 percent lower) than average wintertime uses for these water use sectors. However, severe water conservation measures must be implemented by all to achieve the overall Stage 4 water demand reduction goal of 50 percent.

### Implementation of Residential and Non-Residential Water Use Allotments

Table 9-9 shows how the residential and non-residential water use allotments for Stages 3 and 4 of the Water Shortage Contingency can reduce the overall water use within the City. As shown, using 2006 as the base year, implementation of the Stage 3 allotments results in an overall water use reduction of about 39 percent. Implementation of the Stage 4 allotments results in an overall water use reduction of about 51 percent. As such, these water use reductions are consistent with the water use reduction goals for Stages 3 and 4 of the Water Use Reduction Plan.

**Table 9-9. Stage 3 and 4 Water Use Allotments and Resulting Water Use Reductions (DWR Table 27)**

Customer/ Connection Type	2006 Annual Water Use, af	Stage 3 Reductions			Stage 4 Reductions		
		Allotment	Resulting Water Use, af	Annual Percent Reduction	Allotment	Resulting Water Use, af	Annual Percent Reduction
Single Family Residential	81,398	110% of 2006 Average Residential Wintertime Water Use: 108 gpcd	37,818	54%	95% of 2006 Average Residential Wintertime Water Use: 93 gpcd	32,661	60%
Multi-Family Residential	22,471	110% of 2006 Average Residential Wintertime Water Use: 108 gpcd	19,674	12%	95% of 2006 Average Residential Wintertime Water Use: 93 gpcd	16,991	24%
Commercial/ Institutional	24,928	85% of Average Annual Usage	21,189	15%	65% of Average Annual Usage	16,203	35%
Industrial	3,865	85% of Average Annual Usage	3,285	15%	75% of Average Annual Usage	2,899	25%
Landscape Irrigation	7,514	50% of Average Annual Usage	3,757	50%	0% of Average Annual Usage	0	100%
<b>Total Reduction (not including Unaccounted For Water)</b>	<b>140,175</b>		<b>85,722</b>	<b>39%</b>		<b>68,754</b>	<b>51%</b>
<b>Demand Reduction Goal</b>				<b>35%</b>			<b>50%</b>

**PENALTIES AND CHARGES**

10632 (f) Penalties or charges for excessive use, where applicable.

**Excessive Water Use**

Because the City’s single-family residential customers are currently unmetered and are billed for water use based on a monthly flat-rate, no penalties or charges can be assessed for excessive water use by a single-family residential customer.

Although all other customers are metered and billed based on actual water usage, they are currently billed based on a uniform rate structure which does not increase as usage increases and does not encourage water conservation as increasing block rates would. Furthermore, no penalties or charges for excessive water use are assessed for the City's metered customers.

However, as part of the City's compliance with AB514 (discussed in Chapter 8), on or before March 1, 2013, the City will be required to charge each customer that has a service connection for which a meter is installed based on the volume of deliveries as measured by the water meter. This likely would encourage additional water conservation.

### **Violation of City Municipal Code Section 6-520 Wastage of Water**

The City does, however, have penalties for violation of the water use restrictions outlined in the City's Municipal Code<sup>7</sup>. In the event any person violates any provisions of Section 6-520 of the City Municipal Code, the following shall apply:

- For the first incident of water wastage, the fee designated in the Master Fee Resolution shall be deferred for a period of two years conditioned upon the customer not having a fourth incident of water wastage within a two-year period. If the customer does not have such fourth incident of water wastage within two years such deferral shall become permanent. However, such fee shall be due and owing by the customer if a fourth incident of water wastage occurs within two years.
- The fee for the second incident of water wastage shall be deferred for customers who attend a course in water conservation. The deferral shall be conditioned upon the customer's successful completion of a water conservation course provided by the Department of Public Utilities and the customer not having a third incident of water wastage within a two-year period. The deferred fee shall be collected if a third incident of water wastage occurs within a two-year period.
- The fee for the third incident of water wastage within a two-year period shall be the fee designated in the Master Fee Resolution (plus any fee deferred from the second incident of water wastage). A customer shall have the option of submitting proof of implementation of retrofit measures of no less value than the fee imposed for such third incident of water wastage in lieu of that fee. Retrofit measures of a value less than that fee shall be credited toward payment of the fee.
- The fee for the fourth incident of water wastage within a two-year period shall include the amount as designated in the Master Fee Schedule together with all applicable amounts previously deferred as described above.

If a customer has more than four incidents of water wastage within a two-year period, the City may implement any or all of the following measures:

---

<sup>7</sup> Source: City Municipal Code, Section 6-520 Wastage of Water.

- Require the customer to get a landscape evaluation, lawn water audit, and water budget, as appropriate, in order to learn efficient water use. Landscape irrigation auditors certified by the Irrigation Association would complete this work at the customer's expense.
- Require a customer to repair any defects in the watering system of such customer within fourteen days of notice by the City to repair.
- Installation by the City of flow restrictors or termination of water service for exterior use.
- Termination of all water service to a customer unless in the opinion of the Director of Public Utilities such termination would result in an unreasonable risk to the health and safety of persons.
- Require that restoration of water service after termination be contingent on an agreement by the customer to adhere to the provisions of the Section 6-520 of the City Municipal Code.

Table 9-10 summarizes the City's penalties and charges.

## REVENUE AND EXPENDITURE ANALYSIS

*10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), 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.*

### Potential Revenue Impacts

Based on FY 04/05, approximately 60 percent of the City's revenues from water charges are derived from single-family residential customers which are not metered and are billed based on a monthly flat rate. The other approximately 40 percent of revenues from water charges are derived from metered customers which are billed on a metered rate based on actual water consumption. Therefore, as customer water use decreases, only the portion of revenue derived from metered customers will be impacted. Revenue from the flat rate customers would remain the same, regardless of any reduction in actual water use by those flat rate customers. Table 9-11 demonstrates the potential impacts to the City's revenue as a result of implementation of the Water Shortage Contingency Plan.

**Table 9-10. Penalties and Charges (DWR Table 28)**

Penalty or Charge	Description of Penalty or Charge
Penalty for Excess Use	<p>Single-Family Residential Customers:</p> <ul style="list-style-type: none"> <li>• Currently billed based on flat rate</li> <li>• No penalty for excess use <sup>(a)</sup></li> </ul> <p>All Other Customers:</p> <ul style="list-style-type: none"> <li>• Currently billed based on uniform metered rate</li> <li>• Pay for all water used</li> <li>• No penalty for excess use <sup>(a)</sup></li> </ul>
Charge for Excess Use	<p>Single-Family Residential Customers:</p> <ul style="list-style-type: none"> <li>• Currently billed based on flat rate</li> <li>• No charge for excess use <sup>(a)</sup></li> </ul> <p>All Other Customers:</p> <ul style="list-style-type: none"> <li>• Currently billed based on uniform metered rate</li> <li>• Pay for all water used</li> <li>• No additional charge for excess use <sup>(a)</sup></li> </ul>
Penalties for violation of the water use restrictions	<p>Fee applied per Master Fee Resolution and provisions of Municipal Code (Section 6-520). Also, if four incidents occur within two-year period:</p> <ul style="list-style-type: none"> <li>• Require the customer to get a landscape evaluation, lawn water audit, and water budget</li> <li>• Require a customer to repair any defects in the watering system of such customer</li> <li>• Installation by the City of flow restrictors or termination of water service for exterior use</li> <li>• Termination of all water service to a customer</li> <li>• Require that restoration of water service after termination be contingent on an agreement by the customer to adhere to the provisions of the Section 6-520 of the City Municipal Code</li> </ul>

<sup>(a)</sup> If excess use is identified, customer would be subject to penalty for violation of water use restrictions.

**Table 9-11. Potential Water Revenue Impacts During a Water Shortage**

	Revenue, million \$				
	FY 2004/05 Revenue <sup>(a)</sup>	Stage 1: 10% Shortage	Stage 2: 10-25% Shortage	Stage 3: 25-35% Shortage	Stage 4: 35-50% Shortage
Anticipated Reduction in Water Sales, percent		10%	25%	35%	50%
Revenue from Flat Rate Water Charges	\$22.8	\$22.8	\$22.8	\$22.8	\$22.8
Revenue from Metered Rate Water Charges <sup>(b)</sup>	\$14.6	\$13.1	\$11.0	\$9.5	\$7.3
Other Revenues	\$8.5	\$8.5	\$8.5	\$8.5	\$8.5
<b>Total Water Revenue</b>	<b>\$45.9</b>	<b>\$44.4</b>	<b>\$42.3</b>	<b>\$40.8</b>	<b>\$38.6</b>
Reduction in Water Revenues, percent		3%	8%	11%	16%

<sup>(a)</sup> Source: FY 2004/05 revenue data received from Henry McLaughlin on 06/30/06.

<sup>(b)</sup> Revenue from metered rate water customers assumed to decrease by same percentage as water use reduction.

As shown in Table 9-11, the current flat rate structure for single-family residential customers, although not conducive to water conservation, contributes to some stabilization of the City's water revenue stream during water shortage periods. This is demonstrated by the Stage 4 revenue reduction of only about 16 percent, even when water sales are reduced by 50 percent.

However, in the future, as the City implements its Residential Water Metering Program, fewer and fewer customers will be billed on a flat rate structure and, eventually, all customers will be metered and billed based on a metered rate. As this transition occurs, the City will become potentially more vulnerable to revenue impacts during periods when water use is reduced.

### Potential Expenditure Impacts

During a water shortage, the City's expenditures for water-related services may be impacted. Expenditures may increase for a number of reasons, including the following:

- Increased conservation program costs to implement, monitor, and enforce new or more intensive water conservation programs
- Increased staff costs for operation and maintenance of facilities to ensure efficient operation of available facilities
- Increased costs for acquisition and treatment of additional surface water supplies, if needed to compensate for decreased groundwater supplies

- Increased costs for groundwater pumping, if additional groundwater pumping is needed to compensate for decreased surface water supplies or if more energy is required because of increased pumping lifts associated with decreasing groundwater levels (although these increased groundwater pumping costs may be offset by overall lower groundwater production costs due to the lower overall demand)

Table 9-12 demonstrates how these costs might increase for the various stages of the City's Water Shortage Contingency Plan and how overall operating expenditures might be impacted. For this analysis, the following cost increases have been assumed:

- Conservation program costs:
  - Stage 1: 5 percent increase over pre-shortage costs
  - Stage 2: 10 percent increase over pre-shortage costs
  - Stage 3: 15 percent increase over pre-shortage costs
  - Stage 4: 25 percent increase over pre-shortage costs
- Groundwater production costs:
  - No net change over pre-shortage costs<sup>8</sup>
- Surface Water Treatment Facility costs:
  - 5 percent increase over pre-shortage costs for each stage (e.g., 5 percent for Stage 1, 10 percent for Stage 2, etc.)
- Water supply costs:
  - 5 percent increase over pre-shortage costs for each stage (e.g., 5 percent for Stage 1, 10 percent for Stage 2, etc.)

As shown in Table 9-12, with the assumed increases in certain expenditures, overall water expenditures may increase somewhat during the various stages of the Water Shortage Contingency Plan. As shown in Table 9-12, these increases in expenditures, coupled with reductions in revenue, could potentially significantly impact the City's annual surplus or shortfall.

### Proposed Measures to Overcome Revenue and Expenditure Impacts

Table 9-13 summarizes the two primary measures that may be implemented to overcome revenue and expenditure impacts:

- Water rate increases, and
- Development and use of reserve funds.

---

<sup>8</sup> A net cost increase of 0 percent is assumed for groundwater production because even though the number of wells operated may decrease due to lower demand, it will likely be more expensive to operate the remaining wells due to higher pumping lifts as a result of declining groundwater levels during drought conditions. These changes in operational cost are assumed to cancel each other out for a net cost increase of 0 percent per stage.

Table 9-12. Revenue and Expenditure Analysis  
WITHOUT Rate Increases  
(all costs rounded to nearest \$1,000)

	FY 04/05	Stage 1 (10% Conservation)	Stage 2 (25% Conservation)	Stage 3 (35% Conservation)	Stage 4 (50% Conservation)
<b>Water Revenues</b>					
Water Charges	\$ 22,829,000	\$ 22,829,000	\$ 22,829,000	\$ 22,829,000	\$ 22,829,000
Flat Rate Charges <sup>(a)</sup>	\$ 14,620,000	\$ 13,158,000	\$ 10,965,000	\$ 9,503,000	\$ 7,310,000
Metered Rate Charges <sup>(a)</sup>	\$ 8,497,000	\$ 8,497,000	\$ 8,497,000	\$ 8,497,000	\$ 8,497,000
Other Revenues (includes backflow/misc. interest, transfers, and other misc revenue)	\$ 45,946,000	\$ 44,484,000	\$ 42,291,000	\$ 40,829,000	\$ 38,636,000
<b>Total Water Operating Revenues</b>					
	\$ 45,946,000	\$ 44,484,000	\$ 42,291,000	\$ 40,829,000	\$ 38,636,000
<b>Percent Increase (Reduction)</b>		<b>-3%</b>	<b>-8%</b>	<b>-11%</b>	<b>-16%</b>
<b>Water Expenditures</b>					
Operating					
Administration	\$ 3,120,000	\$ 3,120,000	\$ 3,120,000	\$ 3,120,000	\$ 3,120,000
Water Quality	\$ 1,904,000	\$ 1,904,000	\$ 1,904,000	\$ 1,904,000	\$ 1,904,000
Water Production <sup>(b)</sup>	\$ 9,225,000	\$ 9,225,000	\$ 9,225,000	\$ 9,225,000	\$ 9,225,000
Distribution Maintenance	\$ 1,938,000	\$ 1,938,000	\$ 1,938,000	\$ 1,938,000	\$ 1,938,000
Meter/Cross Connection Control	\$ 1,074,000	\$ 1,074,000	\$ 1,074,000	\$ 1,074,000	\$ 1,074,000
Surface Water Treatment Facility <sup>(c)</sup>	\$ 1,313,000	\$ 1,379,000	\$ 1,444,000	\$ 1,510,000	\$ 1,576,000
Recharge Maintenance	\$ 313,000	\$ 313,000	\$ 313,000	\$ 313,000	\$ 313,000
Conservation Service <sup>(d)</sup>	\$ 597,000	\$ 627,000	\$ 657,000	\$ 687,000	\$ 746,000
Litigation	\$ 138,000	\$ 138,000	\$ 138,000	\$ 138,000	\$ 138,000
Water Supply <sup>(e)</sup>	\$ 3,436,000	\$ 3,608,000	\$ 3,780,000	\$ 3,951,000	\$ 4,123,000
ISF Charges <sup>(f)</sup>	\$ 7,385,000	\$ 7,385,000	\$ 7,385,000	\$ 7,385,000	\$ 7,385,000
Services Provided to Other Divisions	\$ 34,000	\$ 34,000	\$ 34,000	\$ 34,000	\$ 34,000
<b>Subtotal Operating Expenditures</b>	\$ 30,477,000	\$ 30,745,000	\$ 31,012,000	\$ 31,279,000	\$ 31,576,000
Capital Expenditures	\$ 11,540,000	\$ 11,540,000	\$ 11,540,000	\$ 11,540,000	\$ 11,540,000
Debt Service	\$ 4,303,000	\$ 4,303,000	\$ 4,303,000	\$ 4,303,000	\$ 4,303,000
<b>Total Water Enterprise Expenditures <sup>(e)</sup></b>	\$ 46,320,000	\$ 46,588,000	\$ 46,855,000	\$ 47,122,000	\$ 47,419,000
<b>Percent Increase (Reduction) in Expenditures <sup>(e)</sup></b>		<b>1%</b>	<b>1%</b>	<b>2%</b>	<b>2%</b>
<b>Total Annual Surplus (Shortfall)</b>	<b>(\$374,000)</b>	<b>(\$2,104,000)</b>	<b>(\$4,564,000)</b>	<b>(\$6,293,000)</b>	<b>(\$8,783,000)</b>

<sup>(a)</sup> Metered Rate Charges assumed to decrease by the same percentage as total water use is reduced  
<sup>(b)</sup> Water Production from groundwater wells assumed to have no net increase (production from individual wells may increase due to increased pumping lifts, but overall demand for groundwater should decrease as demand decreases)  
<sup>(c)</sup> Surface Water Treatment Facility costs assumed to increase by 5% per stage as costs to operate WTP increase with each stage (additional surface water production requirements, overtime, etc.)  
<sup>(d)</sup> Conservation Service costs assumed to increase 5% for Stage 1, 10% for Stage 2, 15% for Stage 3 and 25% for Stage 4 for additional staff time, advertising to educate customers about need for conservation and enforcement of conservation measures  
<sup>(e)</sup> Water Supply costs assumed to increase 5% per stage as additional surface water supplies are required to compensate for reduction in groundwater supply with each stage.  
<sup>(f)</sup> ISF Charges are for services provided by other City divisions  
<sup>(g)</sup> Relative to FY 04/05 expenditures

**Table 9-13. Proposed Measures to Overcome Revenue and Expenditures Impacts (DWR Tables 29 and 30)**

Name of Measure	Anticipated Effect
Water Rate Increase	Increase flat and metered water rates to maintain revenues at pre-water shortage levels and compensate for increased expenditures associated with the water shortage condition
Development and Use of Reserves	Develop and use reserves to minimize the need or amount of water rate increases

Table 9-14 demonstrates how a water rate increase might impact the City’s revenue and expenditures during various stages of the Water Shortage Contingency Plan. For this analysis, the following water rate increases have been assumed.

- Stage 1: No rate increase; use of reserves as needed
- Stage 2: No rate increase; use of reserves as needed
- Stage 3: 22.5 percent over pre-shortage rates
- Stage 4: 11.5 percent over Stage 3 rates; overall 34 percent over pre-shortage rates
- Post-shortage: 15 percent over pre-shortage rates

Upon implementation of Stages 1 and 2, it has been assumed that the City will use its reserves to compensate for lower revenues and/or higher expenditures, such that water rate increases would not take effect until Stage 3 of the Water Shortage Contingency Plan. However, if conditions require that the City remain in Stages 1 or 2 for more than two years, or reversing out of a higher stage into Stages 1 or 2 results in the Water Shortage Contingency Plan being implemented for more than two years, water rate increases may also be required.

It should be noted that for this analysis, it has been assumed that the water rate increases will be applied to both flat rate water accounts and metered water accounts. As shown in Table 9-14, the use of reserves in Stages 1 and 2 and implementation of the water rate increases in Stages 3 and 4 helps to stabilize the City’s revenues and compensate for increased expenditures during the water shortage.

Historically, most California water agencies that have experienced water shortages have found that it required several years for individual customer water use to return to pre-shortage levels. While this continued pattern of water conservation is desirable and generally beneficial to all, it can result in continued reduced water revenues, which may have an adverse impact on the financial condition of the City’s water enterprise. Therefore, in anticipation of reduced water sales following a shortage, the City’s water rates would be set at 15 percent over the pre-shortage rates. Any excess revenues collected as a result of this rate adjustment would be used to re-establish the City’s reserves for use in future emergencies.

**Table 9-14. Revenue and Expenditure Analysis  
WITH Rate Increases**  
(all costs rounded to nearest \$1000)

	FY 04/05	Stage 1 (10% Conservation)	Stage 2 (25% Conservation)	Stage 3 (35% Conservation)	Stage 4 (50% Conservation)
<b>Rate Increase (to be applied to all flat rate and metered rate customers)</b>					
Required Water Rate Increase by Phase		0%	0%	22.5%	11.5%
Total Required Water Rate Increase over Current Rates		0%	0%	22.5%	34.0%
<b>Water Revenues</b>					
Water Charges					
Flat Rate Charges	\$ 22,829,000	\$ 22,829,000	\$ 22,829,000	\$ 27,966,000	\$ 30,591,000
Metered Rate Charges <sup>(a)</sup>	\$ 14,620,000	\$ 13,158,000	\$ 10,965,000	\$ 11,641,000	\$ 9,795,000
Other Revenues (includes backflow/misuse, interest, transfers, and other miscellaneous revenue)	\$ 8,497,000	\$ 8,497,000	\$ 8,497,000	\$ 8,497,000	\$ 8,497,000
Total Water Operating Revenues	\$ 45,946,000	\$ 44,484,000	\$ 42,291,000	\$ 48,104,000	\$ 48,883,000
Percent Increase (Reduction) in Revenue		-3%	-8%	5%	6%
<b>Water Expenditures</b>					
Operating					
Administration	\$ 3,120,000	\$ 3,120,000	\$ 3,120,000	\$ 3,120,000	\$ 3,120,000
Water Quality	\$ 1,904,000	\$ 1,904,000	\$ 1,904,000	\$ 1,904,000	\$ 1,904,000
Water Production <sup>(b)</sup>	\$ 9,225,000	\$ 9,225,000	\$ 9,225,000	\$ 9,225,000	\$ 9,225,000
Distribution Maintenance	\$ 1,938,000	\$ 1,938,000	\$ 1,938,000	\$ 1,938,000	\$ 1,938,000
Meter/Cross Connection Control	\$ 1,074,000	\$ 1,074,000	\$ 1,074,000	\$ 1,074,000	\$ 1,074,000
Surface Water Treatment Facility <sup>(c)</sup>	\$ 1,313,000	\$ 1,379,000	\$ 1,444,000	\$ 1,510,000	\$ 1,576,000
Recharge Maintenance	\$ 313,000	\$ 313,000	\$ 313,000	\$ 313,000	\$ 313,000
Conservation Service <sup>(d)</sup>	\$ 597,000	\$ 627,000	\$ 657,000	\$ 687,000	\$ 746,000
Litigation	\$ 138,000	\$ 138,000	\$ 138,000	\$ 138,000	\$ 138,000
Water Supply <sup>(e)</sup>	\$ 3,436,000	\$ 3,608,000	\$ 3,780,000	\$ 3,951,000	\$ 4,123,000
ISF Charges <sup>(f)</sup>	\$ 7,385,000	\$ 7,385,000	\$ 7,385,000	\$ 7,385,000	\$ 7,385,000
Services Provided to Other Divisions	\$ 34,000	\$ 34,000	\$ 34,000	\$ 34,000	\$ 34,000
Subtotal Operating Expenses	\$ 30,477,000	\$ 30,745,000	\$ 31,012,000	\$ 31,279,000	\$ 31,576,000
Capital Expenditures	\$ 11,540,000	\$ 11,540,000	\$ 11,540,000	\$ 11,540,000	\$ 11,540,000
Debt Service	\$ 4,303,000	\$ 4,303,000	\$ 4,303,000	\$ 4,303,000	\$ 4,303,000
Total Water Operating Expenditures <sup>(g)</sup>	\$ 46,320,000	\$ 46,588,000	\$ 46,855,000	\$ 47,122,000	\$ 47,419,000
Percent Increase (Reduction) in Expenditures <sup>(h)</sup>		1%	1%	2%	2%
Proposed Use of Reserve Funds	\$ -	\$ 2,565,000	\$ 5,487,000	\$ -	\$ -
Total Annual Surplus (Shortfall) <sup>(i)</sup>	\$ (374,000)	\$ 461,000	\$ 923,000	\$ 982,000	\$ 1,464,000

<sup>(a)</sup> Metered Rate Charges assumed to decrease by the same percentage as total water use is reduced

<sup>(b)</sup> Water Production from groundwater wells assumed to have no net increase (production from individual wells may increase due to increased pumping lifts, but overall demand for groundwater should decrease as demand decreases)

<sup>(c)</sup> Surface Water Treatment Facility costs assumed to increase by 5% per stage as costs to operate WTP increase with each stage (additional surface water production requirements, overtime, etc.)

<sup>(d)</sup> Conservation Service costs assumed to increase 5% for Stage 1, 10% for Stage 2, 15% for Stage 3 and 25% for Stage 4 for additional staff time, advertising to educate customers about need for conservation and enforcement of conservation measures

<sup>(e)</sup> Water Supply costs assumed to increase 5% per stage as additional surface water supplies are required to compensate for reduction in groundwater supply with each stage

<sup>(f)</sup> ISF Charges are for services provided by other City divisions.

## DRAFT WATER SHORTAGE CONTINGENCY RESOLUTION

*10632 (h) A draft water shortage contingency resolution or ordinance.*

Appendix J contains a draft resolution which can be used to implement one or more stages of the Water Shortage Contingency Plan. The draft resolution is provided as a model, and the text of any resolution and/or ordinance actually adopted may vary from the draft provisions presented in Appendix J.

## MECHANISMS FOR DETERMINING ACTUAL WATER USE REDUCTIONS

*10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.*

The City's water production (including surface water treatment facility production and well production) is continuously monitored by the City's SCADA system. Under normal, non-shortage conditions, totals are reported weekly to the Water Chief of Operations, and monthly to the Water Division Manager as part of the monthly update of the "Goldbook" (the City's compilation of water production data and statistics).

During a Stage 1 or Stage 2 water shortage, production figures will be reported to the Water Chief of Operations daily. The Water Chief of Operations will then compare the weekly production to the target weekly production to verify that the reduction goal is being met. Weekly reports would be forwarded to the Water Division Manager and the Director of Public Utilities. If reduction goals are not met, the Director of Public Utilities would notify the City Manager, Mayor's Office and City Council so that corrective action (i.e., implementation of additional water use restrictions) could be taken.

During a Stage 3 or Stage 4 water shortage, the procedure would remain the same, with the addition of a daily production report to the Water Division Manager.

If the water shortage is the result of a disaster, production figures will be reported to the Water Chief of Operations hourly or on demand, and to the Water Division Manager daily. Regular reports will also be provided to the City Manager, Mayor's Office, City Council, California Department of Health Services, and the City and/or Fresno County Office of Emergency Services, as warranted by the emergency.

Table 9-15 provides a summary of the reporting schedule for the various phases of the Water Shortage Contingency Plan. As shown, with each stage of the Water Shortage Contingency Plan, the water production reporting becomes more frequent, allowing Water Division staff and management to effectively monitor water use and recommend corrective action as needed.

**Table 9-15. Water Production Monitoring Reporting Schedule**

Stage	Reports to Water Chief of Operations	Reports to Water Division Manager	Reports to Director of Utilities	Reports to City Manager, Mayor's Office, City Council, County OES
Normal	Weekly	Monthly	Monthly	As needed
Stage 1	Daily	Weekly	Weekly	As needed
Stage 2				
Stage 3	Daily	Daily	Weekly	As needed
Stage 4				
Emergency/Disaster	Hourly or On Demand	Daily	Weekly	As needed

Table 9-16 summarizes the water use monitoring mechanisms used by the City.

**Table 9-16. Water Use Monitoring Mechanisms (DWR Table 31)**

Mechanisms for Determining Actual Reduction	Type and Quality of Data Expected
SCADA Monitoring of Water System	Continuous monitoring of surface water treatment facility and well production
Regular Reporting of Production Data	Production figures regularly reported to Water Chief of Operations and Water Division Manager to monitor overall system water demands and demand reductions (if applicable)
Increased Reporting of Production Data During Water Shortages	Production figures reported to Water Chief of Operations, Water Division Manager and Director of Public Utilities to monitor overall system water demands and demand reductions (if applicable) Reporting to City Manager, Mayor's Office and City Council (if corrective action required) and County OES (if applicable)

# CHAPTER 10. RECYCLED WATER

*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.*

## PARTICIPATING AGENCIES

*10633. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.*

Table 10-1 lists the agencies involved in recycled water planning and use within the City's water service area. Also shown in Table 10-1 are the roles of each agency as related to wastewater and recycled water.

**Table 10-1. Agencies Participating in Recycled Water Activities (DWR Table 32)**

Agency Name	Recycled Water Roles
City of Fresno	Designated sewage agency for the local metropolitan area Operates the Regional Wastewater Reclamation Facility (RWRF)
City of Clovis	Purchases wastewater capacity in the RWRF collection system to convey flow to the RWRF
Fresno Irrigation District (FID)	Receives a portion of the percolated treated wastewater effluent for distribution through their own canal systems for irrigation purposes within their service area

## EXISTING WASTEWATER COLLECTION AND TREATMENT SYSTEMS AND RECYCLED WATER USE

### Wastewater Collection and Treatment Systems

*10633 (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.*

#### Existing Wastewater Collection Systems

The City of Fresno wastewater collection system conveys wastewater by gravity pipelines to the Fresno/Clovis Regional Wastewater Reclamation Facility (RWRF) located southwest of the City. This collection system also conveys wastewater from the City of Clovis, Pinedale Public Utility District, and the Pinedale County Water District. The City of Clovis has four collection system connections.

There are several large formerly unsewered areas within the City's SOI that have been slowly connected to the RWRf collection system. These areas include Old Figarden, Mayfair, and Sunnyside (much of which remains unsewered), and an area on Clovis Avenue between Belmont and McKinley. The Fort Washington Area in the northern portion of the City remains unsewered. The area of remaining unsewered land included in the Sunnyside and Fort Washington Area totals approximately 830 acres.

The Draft Wastewater Collection System Master Plan (2004 Plan) summarizes the planned collection system facilities and improvements to the existing system. The City is projecting new growth to occur in primarily two areas: the North Growth Area (NGA) and the Southeast Growth Area (SEGA).

- The NGA will be served by constructing a satellite wastewater treatment plant which is anticipated to be operational in 2008. This plant will have an initial capacity of 0.71 mgd. Solids from the plant will be discharged into the City's collection system via a new 1.3 mgd lift station and force main. The treated wastewater will be used to meet non-potable landscape irrigation in the local area (e.g., Copper River golf course) (see additional discussion below).
- For the SEGA, a satellite treatment plant has also been discussed, but has been shown to be cost-prohibitive in recent studies. However, as a result of the Metro Plan Update, the City will be preparing a Recycled Water Distribution Master Plan to identify potential future recycled water use areas within the Southeast Growth Area, other future growth areas, and other areas within the City, as well as plan for the recycled water infrastructure required to serve these areas.

The City of Clovis has built a satellite treatment plant that treats 2.8 mgd of wastewater that was formerly discharged to the Fowler Trunk Sewer Main. The City of Clovis is planning to expand the capacity of this new treatment facility to 8.4 mgd in the near future. Because the North Trunk intercepts the Fowler Trunk, this will reduce the City of Clovis' flow to the RWRf. Solids from this plant will be handled on-site.

### Existing Wastewater Treatment Systems

#### *Regional Wastewater Reclamation Facility*

The Fresno-Clovis RWRf has a treatment capacity of approximately 80 mgd (annual monthly average daily discharge flow). It provides secondary wastewater treatment with effluent disposal to a combination of percolation ponds and irrigation reuse. The facility consists of a headworks followed by primary settling and the secondary activated sludge biological treatment processes. The facility has the capability of incorporating the old trickling filter plant into the process to augment the activated sludge process.

Secondary effluent is discharged into a canal system feeding a series of percolation ponds. Local farmers utilize a portion of the effluent for direct re-use on agricultural land. The City also reclaims a significant portion of this previously recharged effluent by extracting incidentally recharged groundwater and delivering it to FID. FID then delivers this water downstream to customers during the irrigation season.

The City is currently in the process of upgrading the organic treatment capacity of the RWRf. The upgrades will be completed in mid-2009 and will provide greater flexibility in responding to the treatment challenges specific to the Fresno-Clovis wastewater composition. Challenges pertain to the fact that a large component of the Fresno-Clovis wastewater is comprised of industrial effluent. This requires a treatment facility with the capability of responding with a variety of treatment alternatives to deal with this impact.

Table 10-2 presents the projected quantity of wastewater collected and treated at the RWRf, and the quantity available for recycled water use. As shown, the City currently uses most of the treated effluent for direct use on farmland and incidental percolation to groundwater. In the future, by 2025, as part of the Metro Plan Update, the City is planning to provide tertiary treatment at the RWRf and/or at other satellite wastewater treatment plants to supply tertiary treated recycled water for landscape irrigation in new growth areas and existing landscaped areas throughout the City's service area.

#### *North Fresno Wastewater Reclamation Facilities (WRF) Satellite Plant*

The North Fresno WRF was recently built to serve the Copper River development and golf course in the northern part of Fresno. The permitted capacity of the plant is 0.71 mgd (average monthly flow) and 1.08 mgd (maximum daily flow). The plant is master planned for expansion to 1.25 mgd average monthly flow at buildout.

Beginning in 2008, disinfected tertiary recycled water from the North Fresno WRF will be used to irrigate the Copper River Golf Course. The golf course is within the City Limits of Fresno. Until now, the golf course has been irrigated almost exclusively with surface water provided by FID, with apparently a minimal amount from an agricultural well.

During wet weather months, recycled water in excess of turf demands will be dechlorinated and sent to a nearby percolation basin owned by FMFCD, and used to irrigate landscaped areas within the basin. As shown in Table 10-2, Projected recycled water use for the North Fresno WRF ranges from about 750 af/yr to about 1,000 af/yr at buildout.

As shown in Table 10-3, no wastewater from the RWRf is currently discharged to surface water. However, some is lost to evaporation from the incidental percolation ponds. This non-discharge operation is anticipated to continue into the future.

**Table 10-2. Wastewater Collected and Treated (DWR Table 33)<sup>(a)</sup>**

	Treatment Level	Wastewater Collected and Treated and Available for Recycled Water Use, af/yr					
		2005	2010	2015	2020	2025	2030
<b>Wastewater Collected and Treated at RWRf</b>							
Combined Inflow to RWRf from Fresno and Clovis	Untreated	78,400	95,400	105,100	109,000	120,300	127,700
Outflow from RWRf:	Undisinfected Secondary						
Fresno Portion		68,200	85,100	93,700	100,700	107,300	113,900
Clovis Portion		10,200	10,300	11,400	12,200	13,000	13,800
<b>Wastewater Collected and Treated at North Fresno WRF</b>							
Outflow from North Fresno WRF	Tertiary	0	750	1,000	1,000	1,000	1,000
<b>Total Fresno Wastewater Outflow</b>		<b>68,200</b>	<b>85,850</b>	<b>94,700</b>	<b>101,700</b>	<b>108,300</b>	<b>114,900</b>
<b>Quantity Available for Recycled Water Use within Fresno</b>							
Fresno Portion from RWRf	Undisinfected Secondary <sup>(b)</sup>	65,300	81,000	89,100	95,600	77,700	83,900
	Tertiary <sup>(c)</sup>	0	0	0	0	24,000	24,000
From North Fresno WRF	Tertiary	0	750	1,000	1,000	1,000	1,000
<b>Total<sup>(d)</sup></b>		<b>65,300</b>	<b>81,750</b>	<b>90,100</b>	<b>96,600</b>	<b>102,700</b>	<b>108,900</b>

- (a) Based on Table 6-6, City of Fresno Metro Plan Update Final Report dated December 2007, updated to take into account the City's future water supply plan as being developed under Phase 2 of the Metro Plan Update.
- (b) To be used for direct use on farmland or sent to incidental percolation ponds.
- (c) The tertiary treatment may be provided at the RWRf and/or other satellite wastewater treatment plants.
- (d) Does not include evaporation from RWRf percolation ponds (see Table 10-3).

**Table 10-3. Disposal of Wastewater (Non-Recycled) (DWR Table 34)<sup>(a)</sup>**

Method of Disposal	Treatment Level	Wastewater Disposal (Non-Recycled), af/yr					
		2005	2010	2015	2020	2025	2030
Discharged to Surface Water	Undisinfected Secondary	0	0	0	0	0	0
Evaporation from Percolation Ponds		2,900	4,100	4,600	5,100	5,600	6,000
<b>Total</b>		<b>2,900</b>	<b>4,100</b>	<b>4,600</b>	<b>5,100</b>	<b>5,600</b>	<b>6,000</b>

(a) Table 6-6, City of Fresno Metro Plan Update Final Report dated December 2007.

**Current Recycled Water Use**

10633. (c) A description of the recycled water currently being used in the supplier's service, including, but not limited to, the type, place, and quantity of use.

(e) ...a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

The total quantity of wastewater treated at the RWRf, except for what is lost to evaporation in the incidental percolation ponds (see Table 10-3), is currently used to either directly irrigate City of Fresno and privately owned farmland, or is sent to the incidental percolation basins. A portion of the treated wastewater effluent which incidentally percolates to the groundwater basin is pumped from the groundwater basin and discharged into the FID canal system. Evaporation from the surface of these percolation ponds accounts for the balance of the wastewater effluent (see Table 10-3). Table 10-4 summarizes the current uses of the City's portion of the RWRf treated effluent.

**Table 10-4. Current (2005) Recycled Water Uses (DWR Table 35a)**

Type of Use	Treatment Level	2005 Recycled Water Use <sup>(a)</sup> , af/yr	
Agriculture (Direct Use on Fresno or Private Farmland)	Undisinfected Secondary	7,400	
Landscape Irrigation		0	
Wildlife Habitat		0	
Wetlands		0	
Industrial		0	
Incidental Percolation Ponds		24,500	33,400
Percolated Treated Effluent Extracted for Irrigation Purposes (Pumped Groundwater)			
Percolated Treated Effluent (Net Addition to Groundwater)			
Total Percolated Treated Effluent			
Total			65,300

<sup>(a)</sup> Table 6-6, City of Fresno Metro Plan Update Final Report dated December 2007.

As noted previously, the City did not prepare a 2000 UWMP. Therefore, no projections for 2005 recycled water use were previously made. Furthermore, the City's previous UWMPs, prepared in 1986 and 1993, did not discuss the future use of recycled water. Table 10-5 indicates that no previous projections for recycled water use were made in the City's previous UWMPs.

**Table 10-5. Recycled Water Uses—2000 Projection Compared with 2005 Actual (DWR Table 37)**

Type of Use	2000 Projection for 2005, af/yr	2005 Actual Recycled Water Use <sup>(a)</sup> , af/yr
Agriculture (Direct Use on Fresno or Private Farmland)	No previous projections were made for 2005 recycled water use (no UWMP was prepared in 2000)	7,400
Landscape Irrigation		0
Wildlife Habitat		0
Wetlands		0
Industrial		0
Incidental Percolation Ponds		24,500
Percolated Treated Effluent Extracted for Irrigation Purposes (Pumped Groundwater)		
Percolated Treated Effluent (Net Addition to Groundwater)		<u>33,400</u>
Total Percolated Treated Effluent		57,900
<b>Total</b>		<b>65,300</b>

<sup>(b)</sup> Table 6-6, City of Fresno Metro Plan Update Final Report dated December 2007.

**POTENTIAL AND PROJECTED RECYCLED WATER USE**

10633 (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, 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

Table 10-6 provides a summary of the potential future recycled water uses by the City. These potential future recycled water uses are consistent with the City's future plans to expand use of recycled water for landscape irrigation in new growth areas and throughout the City service area. These potential recycled water uses are based on the City's new North Fresno WRF (scheduled to be on-line in 2008) and the City's future water supply plan, as being developed for the Metro Plan Update. As described in Chapter 4, the City's future water supply plan includes a recycled water supply for landscape irrigation starting in 2025. It is assumed that recycled water will be used in the Southeast Growth Area, and eventually other portions of the City, for landscape irrigation purposes and other non-potable uses.

In the next few years, the City will prepare a Recycled Water Distribution Master Plan to identify potential future recycled water use areas within the Southeast Growth Area, other future growth areas, and other areas within the City, as well as plan for the recycled water infrastructure required to serve these areas. In addition, the City will begin plans to provide the future tertiary treatment facilities required to meet these potential future landscape irrigation demands (see additional discussion below).

**Table 10-6. Potential Recycled Water Uses (DWR Table 35b)<sup>(a,b)</sup>**

Method of Disposal	Treatment Level	Potential Recycled Water Use, af/yr				
		2010	2015	2020	2025	2030
Agriculture (Recycled on Fresno or Private Farmland)	Undisinfected Secondary	7,600	7,600	7,600	7,600	7,600
Wildlife Habitat		0	0	0	0	0
Wetlands		0	0	0	0	0
Industrial		0	0	0	0	0
Incidental Percolation Ponds						
Percolated Treated Effluent Extracted for Irrigation Purposes (Pumped Groundwater)		24,500	24,500	24,500	24,500	24,500
Percolated Treated Effluent (Net Addition to Groundwater)		<u>48,900</u>	<u>57,000</u>	<u>63,500</u>	<u>45,600</u>	<u>51,800</u>
Total Percolated Treated Effluent		73,400	81,500	88,000	70,100	76,300
Landscape Irrigation	Tertiary					
Southeast Growth Area and Other Areas in the City		0	0	0	24,000	24,000
Copper River Golf Course (North Fresno WRF)		<u>750</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>
Total Landscape Irrigation		750	1,000	1,000	25,000	25,000
<b>Total</b>		<b>81,750</b>	<b>90,100</b>	<b>96,600</b>	<b>102,700</b>	<b>108,900</b>

- (a) Based on Table 6-6, City of Fresno Metro Plan Update Final Report dated December 2007, updated to take into account the City's future water supply plan as being developed under Phase 2 of the Metro Plan Update.
- (b) Based on City of Fresno portion of RWRF Outflow and North Fresno WRF outflow only. City of Clovis portion of RWRF outflow not included.

Based on this potential future recycled water use, Table 10-7 provides a summary of the projected future recycled water use by the City.

**Table 10-7. Projected Recycled Water Uses (DWR Table 36)<sup>(a,b)</sup>**

Method of Disposal	Treatment Level	Potential Recycled Water Use, af/yr				
		2010	2015	2020	2025	2030
Agriculture (Recycled on Fresno or Private Farmland)	Undisinfected Secondary	7,600	7,600	7,600	7,600	7,600
Wildlife Habitat		0	0	0	0	0
Wetlands		0	0	0	0	0
Industrial		0	0	0	0	0
Incidental Percolation Ponds						
Percolated Treated Effluent Extracted for Irrigation Purposes (Pumped Groundwater)		24,500	24,500	24,500	24,500	24,500
Percolated Treated Effluent (Net Addition to Groundwater)		<u>48,900</u>	<u>57,000</u>	<u>63,500</u>	<u>45,600</u>	<u>51,800</u>
Total Percolated Treated Effluent		73,400	81,500	88,000	70,100	76,300
Landscape Irrigation	Tertiary					
Southeast Growth Area and Other Areas in the City		0	0	0	24,000	24,000
Copper River Golf Course (North Fresno WRF)		<u>750</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>
Total Landscape Irrigation		750	1,000	1,000	25,000	25,000
<b>Total</b>		<b>81,750</b>	<b>90,100</b>	<b>96,600</b>	<b>102,700</b>	<b>108,900</b>

<sup>(a)</sup> Based on Table 6-6, City of Fresno Metro Plan Update Final Report dated December 2007, updated to take into account the City's future water supply plan as being developed under Phase 2 of the Metro Plan Update.

<sup>(b)</sup> Based on City of Fresno portion of RWRf Outflow and North Fresno WRF outflow only. City of Clovis portion of RWRf outflow not included.

**METHODS TO ENCOURAGE RECYCLED WATER USE**

10633 (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.

As described above, the majority of the future use of recycled water is currently projected to be generally consistent with current recycled water uses (e.g., direct use on farmland and sent to incidental percolation basins). However, as a result of the City’s on-going Metro Plan Update, the City will prepare a Recycled Water Distribution Master Plan to identify potential future recycled water use areas within the Southeast Growth Area, other future growth areas, and areas within the City, as well as plan for the recycled water infrastructure required to serve these areas. To encourage and support future recycled water use, the City will consider the following future policies with regard to recycled water use:

- Require new developments City-wide to install purple pipe for recycled water use on parks, common areas, roadway medians, etc.
- Look for opportunities to install purple pipe near existing landscaped areas (e.g., parks, sports fields) (i.e., piggyback on other pipeline installation/replacement projects)
- Work with FID and/or others to develop an agreement to better use the percolated treated effluent from the RWRP
- Further develop partnerships with FID, Clovis, and others to maximize available water resources
- Allow new development to create “new” supplies by participation in the implementation of recycled water facilities
- Fund and adopt the required Recycled Water Master Plan by 2010
- Provide additional staff and program-specific financial resources required to implement/manage the future recycled water use program

Table 10-8 provides a summary of future methods to encourage future recycled water use.

**Table 10-8. Methods to Encourage Recycled Water Use (DWR Table 38)**

Actions	Acre-feet of Recycled Water Use to Result from this Action				
	2010	2015	2020	2025	2030
Implement future policies to require installation of purple pipe in Southeast Growth Area and other future growth areas to allow for landscape irrigation with recycled water	0	0	0	24,000	24,000
Financial Incentives	Not needed				
<b>Total</b>	0	0	0	24,000	24,000

## OPTIMIZING THE USE OF RECYCLED WATER

*10633 (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 recirculation uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

The RWRP Master Plan includes a schedule of additional infrastructure required to the year 2025, based on projected wastewater flows and load increases. The current (2006) average day annual flow (ADAF) is approximately 72.4 mgd. The projected ADAF for 2015 is 96.0 mgd and for 2025 is 112.5 mgd.

If needed in the future, the current RWRP Master Plan allows for possible future tertiary treatment facilities, namely filtration and disinfection. Although no such facilities are currently required, the infrastructure and piping layout plan provided in the RWRP Master Plan does make provision for such possible new facilities in case of new regulations or demand from a future end-user (i.e., landscape irrigation with recycled water in the Southeast Growth Area as described above). These future treatment facilities would be modular in case only a portion of the effluent needs to undergo tertiary treatment. Such facilities would facilitate the increased use of treated wastewater that meets recycled water standards and the particular needs of end-users. This RWRP Master Plan will be updated in the future as needed to support the production of future tertiary-treated recycled water supplies required as part of the City's future water supply plan.

In addition, as described above, the City is planning to prepare a Recycled Water Distribution Master Plan to identify potential future recycled water use areas within the Southeast Growth Area, other future growth areas, and other areas within the City, as well as plan for the recycled water infrastructure required to serve these areas. The City plans to complete this Master Plan by 2010.

**APPENDIX A1**

---

**Urban Water Management Planning Act**



**Established:** AB 797, Klehs, 1983

**Amended:** AB 2661, Klehs, 1990

AB 11X, Filante, 1991

AB 1869, Speier, 1991

AB 892, Frazee, 1993

SB 1017, McCorquodale, 1994

AB 2853, Cortese, 1994

AB 1845, Cortese, 1995

SB 1011, Polanco, 1995

AB 2552, Bates, 2000

SB 553, Kelley, 2000

SB 610, Costa, 2001

AB 901, Daucher, 2001

SB 672, Machado, 2001

SB 1348, Brulte, 2002

SB 1384, Costa, 2002

SB 1518, Torlakson, 2002

AB 105, Wiggins, 2004

SB 318, Alpert, 2004

## **CALIFORNIA WATER CODE DIVISION 6 PART 2.6. URBAN WATER MANAGEMENT PLANNING**

### **CHAPTER 1. GENERAL DECLARATION AND POLICY**

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**

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**

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.
- (b) Every urban water supplier required to prepare a plan pursuant to this part shall 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).

## **Article 2. Contents of Plans**

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 and 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 those basins for which 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) 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:
    - (1) An average water year.
    - (2) A single dry water year.
    - (3) Multiple dry water years.

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.
  - (2) The water use projections shall be in the same five-year increments described in subdivision (a).

- (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
  - (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:
    - (A) Water survey programs for single-family residential and multifamily residential customers.
    - (B) Residential plumbing retrofit.
    - (C) System water audits, leak detection, and repair.
    - (D) Metering with commodity rates for all new connections and retrofit of existing connections.
    - (E) Large landscape conservation programs and incentives.
    - (F) High-efficiency washing machine rebate programs.
    - (G) Public information programs.
    - (H) School education programs.
    - (I) Conservation programs for commercial, industrial, and institutional accounts.
    - (J) Wholesale agency programs.
    - (K) Conservation pricing.
    - (L) Water conservation coordinator.
    - (M) Water waste prohibition.
    - (N) Residential ultra-low-flush toilet replacement programs.
  - (2) A schedule of implementation for all water demand management measures proposed or described in the plan.
  - (3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

- (4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.
- (g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:
- (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
  - (2) Include a cost-benefit analysis, identifying total benefits and total costs.
  - (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
  - (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.
- (h) 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, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), 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.
- (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
- (j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council

in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

- (k) Urban water suppliers that rely 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).

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. 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.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

- (a) 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 which are applicable to each stage.
- (b) 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.
- (c) 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.

- (d) 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.
- (e) 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.
- (f) Penalties or charges for excessive use, where applicable.
- (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), 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.
- (h) A draft water shortage contingency resolution or ordinance.
- (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

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, 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**

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**

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) 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.

- (b) 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 outstanding 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.

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**

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.

10657.

- (a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.
- (b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

## **APPENDIX A2**

---

### **Additional Urban Water Management Planning Act Provisions**



**Senate Bill No. 1087**

**CHAPTER 727**

An act to amend Section 65589.7 of the Government Code, and to add Section 10631.1 to the Water Code, relating to housing.

[Approved by Governor October 7, 2005. Filed with  
Secretary of State October 7, 2005.]

**LEGISLATIVE COUNSEL'S DIGEST**

SB 1087, Florez. Housing elements: services.

(1) The Planning and Zoning Law requires each city, county, or city and county to prepare and adopt a general plan for its jurisdiction that contains certain mandatory elements, including a housing element. One part of the housing element is an assessment of housing needs and an inventory of resources and constraints relevant to meeting those needs. That law also requires that the housing element adopted by the legislative body of the city, county, or city and county and any amendments made to that element be delivered to all public agencies or private entities that provide water services at retail or sewer services within the territory of the legislative body.

The Planning and Zoning Law also requires each public agency or private entity providing these services to grant a priority for the provision of available and future resources or services to proposed housing developments that help meet the legislative body's share of the regional housing need for lower income households as identified in the housing element and any amendments to the housing element.

This bill would require that the adopted housing element and any amendments be delivered immediately to all public agencies or private entities that provide water or sewer services, as specified, would apply these provisions to proposed developments that include housing units affordable to lower income households, and would require, on or before July 1, 2006, that these public agencies or private entities adopt written policies and procedures, and at least once every 5 years thereafter, with specific objective standards for provision of these services in conformance with these provisions. The bill would also require the Public Utilities Commission to adopt written policies and procedures for use by private water and sewer companies regulated by the commission in a manner consistent with these provisions. By increasing the duties of local public officials, the bill would impose a state-mandated local program.

This bill would also provide that a provider of water or sewer services may not deny or condition the approval of an application for services, or reduce the amount of the services applied for, if the proposed development includes housing affordable to lower income households, except upon making specified findings.

The bill would make these provisions applicable to charter cities.

(2) The Urban Water Management Planning Act requires urban water suppliers to prepare and adopt urban water management plans for submission to the Department of Water Resources, which identify and quantify the existing and planned sources of water available to the water supplier's service area based on specified factors.

This bill would also require that the water use projections required by these provisions include the projected water use for single-family and multifamily residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(3) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that with regard to certain mandates no reimbursement is required by this act for a specified reason.

With regard to any other mandates, this bill would provide that, if the Commission on State Mandates determines that the bill contains costs so mandated by the state, reimbursement for those costs shall be made pursuant to the statutory provisions noted above.

*The people of the State of California do enact as follows:*

SECTION 1. Section 65589.7 of the Government Code is amended to read:

65589.7. (a) The housing element adopted by the legislative body and any amendments made to that element shall be immediately delivered to all public agencies or private entities that provide water or sewer services for municipal and industrial uses, including residential, within the territory of the legislative body. Each public agency or private entity providing water or sewer services shall grant a priority for the provision of these services to proposed developments that include housing units affordable to lower income households.

(b) A public agency or private entity providing water or sewer services shall adopt written policies and procedures, not later than July 1, 2006, and at least once every five years thereafter, with specific objective standards for provision of services in conformance with this section. For private water and sewer companies regulated by the Public Utilities Commission, the commission shall adopt written policies and procedures for use by those companies in a manner consistent with this section. The policies and procedures shall take into account all of the following:

(1) Regulations and restrictions adopted pursuant to Chapter 3 (commencing with Section 350) of Division 1 of the Water Code, relating to water shortage emergencies.

(2) The availability of water supplies as determined by the public agency or private entity pursuant to an urban water management plan

adopted pursuant to Part 2.6 (commencing with Section 10610) of Division 6 of the Water Code.

(3) Plans, documents, and information relied upon by the public agency or private entity that is not an “urban water supplier,” as defined in Section 10617 of the Water Code, or that provides sewer service, that provide a reasonable basis for making service determinations.

(c) A public agency or private entity that provides water or sewer services shall not deny or condition the approval of an application for services to, or reduce the amount of services applied for by, a proposed development that includes housing units affordable to lower income households unless the public agency or private entity makes specific written findings that the denial, condition, or reduction is necessary due to the existence of one or more of the following:

(1) The public agency or private entity providing water service does not have “sufficient water supply,” as defined in paragraph (2) of subdivision (a) of Section 66473.7, or is operating under a water shortage emergency as defined in Section 350 of the Water Code, or does not have sufficient water treatment or distribution capacity, to serve the needs of the proposed development, as demonstrated by a written engineering analysis and report.

(2) The public agency or private entity providing water service is subject to a compliance order issued by the State Department of Health Services that prohibits new water connections.

(3) The public agency or private entity providing sewer service does not have sufficient treatment or collection capacity, as demonstrated by a written engineering analysis and report on the condition of the treatment or collection works, to serve the needs of the proposed development.

(4) The public agency or private entity providing sewer service is under an order issued by a regional water quality control board that prohibits new sewer connections.

(5) The applicant has failed to agree to reasonable terms and conditions relating to the provision of service generally applicable to development projects seeking service from the public agency or private entity, including, but not limited to, the requirements of local, state, or federal laws and regulations or payment of a fee or charge imposed pursuant to Section 66013.

(d) The following definitions apply for purposes of this section:

(1) “Proposed developments that include housing units affordable to lower income households” means that dwelling units shall be sold or rented to lower income households, as defined in Section 50079.5 of the Health and Safety Code, at an affordable housing cost, as defined in Section 50052.5 of the Health and Safety Code, or an affordable rent, as defined in Section 50053 of the Health and Safety Code.

(2) “Water or sewer services” means supplying service through a pipe or other constructed conveyance for a residential purpose, and does not include the sale of water for human consumption by a water supplier to another water supplier for resale. As used in this section, “water service”

provided by a public agency or private entity 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.

(e) This section is intended to neither enlarge nor diminish the existing authority of a city, county, or city and county in adopting a housing element. Failure to deliver a housing element adopted by the legislative body or amendments made to that element, to a public agency or private entity providing water or sewer services shall neither invalidate any action or approval of a development project nor exempt a public agency or private entity from the obligations under this section. The special districts which provide water or sewer services related to development, as defined in subdivision (e) of Section 56426, are included within this section.

(f) The Legislature finds and declares that this section shall be applicable to all cities and counties, including charter cities, because the Legislature finds that the lack of affordable housing is a matter of vital statewide importance.

SEC. 2. Section 10631.1 is added to the Water Code, to read:

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.

SEC. 3. The Legislature finds and declares that Sections 65104 and 66014 of the Government Code provide local agencies with authority to levy fees sufficient to pay for the program or level of service mandated by this act.

SEC. 4. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because a local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the program or level of service mandated by this act, within the meaning of Section 17556 of the Government Code.

However, if the Commission on State Mandates determines that this act contains other costs mandated by the state, reimbursement to local agencies and school districts for those costs shall be made pursuant to Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code.

## **APPENDIX B1**

---

### **Urban Water Management Plan Notifications**





Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

August 14, 2007

Tim Bakman, President  
Bakman Water Company  
P.O. Box 7965  
Fresno, CA 93747

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Mr. Bakman:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in late 2007 or early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

August 14, 2007

Lisa Koehn, Assistant Director  
City of Clovis Department of Public Utilities  
155 N. Sunnyside Avenue  
Clovis, CA 93611

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Ms. Koehn:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in late 2007 or early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "B. D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

August 14, 2007

Alan Weaver, Director  
County of Fresno Department of Public Works & Planning  
2220 Tulare Street, 6<sup>th</sup> Floor  
Fresno, CA 93721

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Mr. Weaver:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in late 2007 or early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "B.D. Buche". The signature is written in a cursive, flowing style.

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

August 14, 2007

Gary Serrato, General Manager  
Fresno Irrigation District  
2907 S. Maple Avenue  
Fresno, CA 93725

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Mr. Serrato:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in late 2007 or early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

August 14, 2007

Bob Van Wyk, General Manager  
Fresno Metropolitan Flood Control District  
5469 E. Olive Avenue  
Fresno, CA 93727

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Mr. Van Wyk:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in late 2007 or early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

August 17, 2007

Mrs. Katherine Alves  
Garfield Irrigation District  
P.O. Box 337  
Clovis, CA 93613

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Mrs. Alves:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in late 2007 or early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in blue ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

August 17, 2007

Darla Wagenleitner, DeAnne Wulf & James Curtis  
Herndon Water Company  
6944 N. Van Buren Avenue  
Fresno, CA 93722

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Ms. Wagenleitner et al.

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in late 2007 or early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

August 14, 2007

Russ Holcomb, General Manager  
Malaga County Water District  
3580 S. Frank Street  
Fresno, CA 93725

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Mr. Holcomb:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in late 2007 or early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "B.D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

August 14, 2007

Larry DeSantos, General Manager  
Pinedale County Water District  
480 W. Birch Avenue  
Pinedale, CA 93650

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Mr. DeSantos:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in late 2007 or early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



Department of Public Utilities

Water Division • 559-621-5300  
1910 E. University Avenue • Fresno, California 93703-2988  
[www.ci.fresno.ca.us](http://www.ci.fresno.ca.us)

February 26, 2008

Ronald D. Jacobsma, General Manager  
Friant Water Users Authority  
854 N. Harvard Avenue  
Lindsay, CA 93247

Subject: Notice of Preparation for City of Fresno Urban Water Management  
Plan Update

Dear Mr. Jacobsma:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently reviewing its previous UWMP and other available water supply planning documents in preparation for the UWMP update. We invite your agency's participation in this update process. A draft of the updated UWMP will be made available for public review and a public hearing will be scheduled in early 2008. In the meantime, if you would like more information regarding the City's UWMP Update, please contact Mr. Brock D. Buche at:

City of Fresno  
Department of Public Utilities, Water Division  
1910 East University Avenue  
Fresno, CA 93703  
Phone: (559) 621-5325  
Fax: (559) 457-1182  
E-mail: [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "B.D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

c: chron file



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
[www.fresno.gov](http://www.fresno.gov)



July 3, 2007

Tim Bakman, President  
Bakman Water Company  
P.O. Box 7965  
Fresno, CA 93747

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Mr. Bakman:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
[www.fresno.gov](http://www.fresno.gov)



*Providing Life's Essential Services*

July 3, 2008

Lisa Koehn, Assistant Director  
City of Clovis Department of Public Utilities  
155 N. Sunnyside Avenue  
Clovis, CA 93611

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Ms. Koehn:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
[www.fresno.gov](http://www.fresno.gov)



July 3, 2007

Gary Serrato, General Manager  
Fresno Irrigation District  
2907 S. Maple Avenue  
Fresno, CA 93725

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Mr. Serrato:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in blue ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
[www.fresno.gov](http://www.fresno.gov)



*Providing Life's Essential Services*

July 3, 2007

Bob Van Wyk, General Manager  
Fresno Metropolitan Flood Control District  
5469 E. Olive Avenue  
Fresno, CA 93727

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Mr. Van Wyk:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "B. D. Buche".

Brock D. Buche, PE, PLS  
Project Manager



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
[www.fresno.gov](http://www.fresno.gov)



*Providing Life's Essential Services*

July 3, 2007

Alan Weaver, Director  
County of Fresno Department of Public Works & Planning  
2220 Tulare Street, 6<sup>th</sup> Floor  
Fresno, CA 93721

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Mr. Weaver:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
[www.fresno.gov](http://www.fresno.gov)



*Providing Life's Essential Services*

July 3, 2007

Ronald D. Jacobsma, General Manager  
Friant Water Users Authority  
854 N. Harvard Avenue  
Lindsay, CA 93247

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Mr. Jacobsma:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "B. D. Buche".

Brock D. Buche, PE, PLS  
Project Manager



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
www.fresno.gov



*Providing Life's Essential Services*

July 3, 2008

Mrs. Katherine Alves  
Garfield Irrigation District  
P.O. Box 337  
Clovis, CA 93613

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Mrs. Alves:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
[www.fresno.gov](http://www.fresno.gov)



Providing Life's Essential Services

July 3, 2008

Darla Wagenleitner, DeAnne Wulf & James Curtis  
Herndon Water Company  
6944 N. Van Buren Avenue  
Fresno, CA 93722

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Ms. Wagenleitner et al.

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "B. Buche".

Brock D. Buche, PE, PLS  
Project Manager



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
[www.fresno.gov](http://www.fresno.gov)



*Providing Life's Essential Services*

July 3, 2007

Russ Holcomb, General Manager  
Malaga County Water District  
3580 S. Frank Street  
Fresno, CA 93725

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Mr. Holcomb:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager



**Department of Public Utilities**

Water Division  
1910 East University Avenue  
Fresno, California 93703-2988  
559-621-5300 – FAX 559-488-1024  
[www.fresno.gov](http://www.fresno.gov)



*Providing Life's Essential Services*

July 3, 2008

Larry DeSantos, General Manager  
Pinedale County Water District  
480 W. Birch Avenue  
Pinedale, CA 93650

Subject: Review and Comment on City of Fresno Draft Urban Water Management Plan

Dear Mr. DeSantos:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10657), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP). The City is currently circulating our Draft UWMP, dated June 2008, for review and comment. The review period during which previously notified agencies may submit written comments on the Draft UWMP will begin on July 7, 2008 and end on July 22, 2008. Comments must be submitted to: Brock D. Buche, Project Manager, City of Fresno Water Division, 1910 E. University Avenue, Fresno, CA 93703.

Additionally, the City will hold a public hearing at 10 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the Draft UWMP.

Should you have any questions please feel free to contact me at (559) 621-5325 or by e-mail at [brock.buche@fresno.gov](mailto:brock.buche@fresno.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Brock D. Buche".

Brock D. Buche, PE, PLS  
Project Manager

**APPENDIX B2**

---

**Fresno Bee Proof of Publication**



ASTONE AGENCY

2300 TULARE STREET #210

FRESNO, CA 93721

PROOF OF PUBLICATION

COUNTY OF FRESNO  
STATE OF CALIFORNIA

EXHIBIT A.

The undersigned states:

McClatchy Newspapers in and on all dates herein stated was a corporation, and the owner and publisher of The Fresno Bee.

The Fresno Bee is a daily newspaper of general circulation now published, and on all-the-dates herein stated was published in the City of Fresno, County of Fresno, and has been adjudged a newspaper of general circulation by the Superior Court of the County of Fresno, State of California, under the date of November 22, 1994, Action No. 520058-9.

The undersigned is and on all dates herein mentioned was a citizen of the United States, over the age of twenty-one years, and is the principal clerk of the printer and publisher of said newspaper; and that the notice, a copy of which is hereto annexed, marked Exhibit A, hereby made a part hereof, was published in The Fresno Bee in each issue thereof (in type not smaller than nonpareil), on the following dates.

*July 7, 14, 2008*

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated JULY 14, 2008

*Connie Mariano*

PUBLIC NOTICE
#152165
<b>PUBLIC NOTICE</b>
<b>NOTICE OF PUBLIC HEARING</b>
<b>CITY OF FRESNO</b>
<b>URBAN WATER MANAGEMENT PLAN</b>
The City of Fresno (City) will hold a public hearing at 10:00 a.m. on Tuesday, July 22, 2008 at the City Council Chambers at the City of Fresno City Hall located at 2600 Fresno Street, to receive public comments on the City's Draft Urban Water Management Plan (UWMP) dated June 2008. The Draft UWMP addresses current and projected water supply availability and reliability and provides a comparison with current and projected water demands through the year 2030. The Draft UWMP also describes the City's current and planned water conservation programs, and provides a water shortage contingency plan in the event of a severe water shortage or water supply emergency.
Interested citizens are invited to make public comments on the Draft UWMP at the public hearing. A copy of the Draft UWMP can found for review at City Hall (2600 Fresno Street), the City of Fresno Public Utilities Department Water Division office (1910 East University Avenue), and the Fresno County Public Library (2420 Mariposa Street). A copy of the Draft UWMP is also posted on the Public Utilities-Water Division page of the City of Fresno website at <a href="http://www.fresnowater.org">www.fresnowater.org</a> . Comments may be submitted by calling the Water Division at (559) 621-5325, or by writing to Mr. Brock Buche, Project Manager, City of Fresno Water Division, 1910 East University Avenue, Fresno, CA 93703. All comments must be received by no later than July 22, 2008.
(PUB: July 7,14, 2008)

## **APPENDIX C**

---

### **Urban Water Management Plan Resolution**





RESOLUTION NO. 2008-207

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF FRESNO TO  
ADOPT AN UPDATE TO THE URBAN WATER MANAGEMENT PLAN

RECITALS

**WHEREAS**, the Urban Water Management Planning Act, codified at California Water Code, sections 10610, *et seq.*, requires every urban water supplier, to prepare and adopt an Urban Water Management Plan and update said plan at least once every five years; and

**WHEREAS**, an Urban Water Management Plan is to generally describe (1) the existing and projected water supply and demand, (2) water conservation measures, including a schedule for implementation and means for evaluating effectiveness; and (3) water supply reliability and water shortage contingency measures over a 20-year planning horizon; and

**WHEREAS**, as an urban water supplier, the City of Fresno has prepared an update to the 1993 Urban Water Management Plan (UWMP) that complies with the requirements of the Urban Water Management Planning Act; and

**WHEREAS**, the City delivered for comment copies of the draft UWMP to many regional water related agencies such as the County of Fresno, Fresno Irrigation District, the City of Clovis, Friant Water Users Authority, etc., and placed copies for public review at the City of Fresno Department of Public Utilities and the County of Fresno Main Library as required by Water Code, section 10642; and

**WHEREAS**, on July 7, 2008 and July 14, 2008 respectively the City published notice in the Fresno Bee that on July 22, 2008 at 10:00 a.m. a public hearing regarding the draft UWMP would be held in Council Chambers at which public comment on the plan would be received, as required by Water Code, section 10642; and

**WHEREAS**, on July 22, 2008 at 10:00 a.m. the public hearing was conducted in Council Chambers at which the public was provided the opportunity to comment on the UWMP; and

**WHEREAS**, the primary goals of the UWMP are to identify a long-term water supply, implement demand management measures and balance the City's groundwater water usage (eliminate overdraft) by 2025, and if successful, will constitute a customer-wide reduction of water usage by 20%; and

**WHEREAS**, to achieve the goals identified by the UWMP the City will significantly reduce its reliability on groundwater requiring the construction of a recycled water system, expansion of the existing surface water treatment facility and construction of an additional facility in southeast Fresno, significant expansion of the groundwater recharge program, installation of water meters and expansion of the existing water Conservation program; and

**WHEREAS**, the City of Fresno water customers currently use approximately 300 gallons of water per person per day and through the implementation of fourteen Demand Management Measures, it is expected that the water usage will be reduced to approximately 243 gallons of water per person per day by the year 2020; and

Adopted \_\_\_\_\_  
Approved 8/19/08  
Efflux \_\_\_\_\_



**WHEREAS**, during the public hearing conducted by City Council on July 22, 2008, the Council discussed the importance of City Departments being accountable to the goals established by the UWMP; and

**WHEREAS**, as part of the City's effort to effectuate the water conservation goals of the UWMP, Department of Public Utilities will either, work with and expand the role of the Fresno Green Team or develop a water team comprising of members from various City Departments to develop strategies to reduce water usage by 20% on City owned properties and right-of-ways; and

**WHEREAS**, in-order to reduce water usage and implement water conservation demand management measures on City owned properties and right-of-way's this team will investigate capital improvement projects, modifications to residential and commercial landscape standards, modifications to maintenance activities, modifications to median island landscape standards and report findings to the City Manger; and

**WHEREAS**, in-order to achieve the 20% reduction goal and implement water conservation measures, departments may seek funding authorization within their annual budgets for capital projects, equipment, materials, staffing and/or consulting services.

**NOW THEREFORE, BE IT RESOLVED** by the Council of the City of Fresno as follows:

- 1) The City hereby adopts an update to the 1993 Urban Water Management Plan, the 2008 Urban Water Management Plan.
- 2) In order to fulfill the objectives of the 2025 General Plan and retain a long term sustainable water supply the City must fund and implement the fourteen Demand Management Measures set forth in the UWMP.
- 3) In order to balance groundwater usage and fulfill the objectives of the 2025 General Plan the City must significantly expand and/or construct surface water treatment facilities, groundwater recharge facilities, a recycled water system and water conservation efforts.
- 4) The City is prepared to implement if required mandatory prohibitions and water use restrictions as described in the Water Shortage Contingency Plan, a component of the UWMP.
- 5) The City Manager is hereby authorized and directed to file the City of Fresno 2008 Urban Water Management Plan with the California Department of Water Resources, the California State Library and the County of Fresno within 30 days after adoption.



\*\*\*\*\*

CLERK'S CERTIFICATION

STATE OF CALIFORNIA )  
COUNTY OF FRESNO ) ss.  
CITY OF FRESNO )

I, REBECCA E. KLISCH, City Clerk of the City of Fresno, certify that the forgoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 19th day of August, 2008.

AYES : Calhoun, Caprioglio, Dages, Sterling, Xiong  
NOES : Duncan, Perea  
ABSENT : None  
ABSTAIN : None

REBECCA E. KLISCH,  
City Clerk

BY: Rebecca Klisch  
Deputy

APPROVED AS TO FORM:

JAMES C. SANCHEZ  
City Attorney

BY: James C. Sanchez 8/13/2008  
Deputy

**APPENDIX D1**

---

**USBR Contract**



Lon's copy



# United States Department of the Interior

BUREAU OF RECLAMATION  
Mid-Pacific Regional Office  
2800 Cottage Way  
Sacramento, California 95825-1898

FEB 16 2005

FEB 16 2005

FEB 16 2005

IN REPLY  
REFER TO:

MP-440  
WTR-4.00

BHIDLEBURG@MP.USBR.GOV

City Council  
City of Fresno  
2600 Fresno Street, Room 3065  
Fresno, California 93721-3624

Subject: Long-Term Renewal Contract No. 14-06-200-8901-LTR1 Between the United States and the City of Fresno (City) Providing for Project Water Service from the Friant Division - Central Valley Project, California

Dear Council Members:

Enclosed are three bluebound originals of the long-term renewal contract. If the enclosed contract is acceptable to the City, please have the authorized officials of the City sign each of the bluebound originals and return all originals to this office, Attention: MP-440 (Ms. Nancy Anderson), **no later than February 24, 2005**, for execution by the Regional Director. Additionally, an original City Council Resolution approving the contract as to form and authorizing the designated officials of the City to execute the contract is to be returned along with the executed contract. Please note that the contract will be dated after execution by the Regional Director of the Mid-Pacific Region.

Execution of the contract by Reclamation is, of course, contingent upon the contractor being in compliance with all terms and conditions of its existing water service contract. After execution and completion of final processing by Reclamation, an original of the contract will be returned to the City.

Once signed, it is imperative that these contracts be returned to this office via overnight delivery service or hand carried to the nearest Area Office (see enclosed listing) by February 24, 2005. If there are any questions, please contact Ms. Barbara Hidleburg, Repayment Specialist, at 559-487-5063 (TDD 559-487-5933).

Sincerely,

Kirk C. Rodgers  
Regional Director

Enclosures - 3

cc: Mr. Martin R. McIntyre  
Director of Public Works  
2600 Fresno Street, Room 3065  
Fresno, California 93721-3624

Mr. Robert Saperstein  
Attorney  
21 East Carrillo Street  
Santa Barbara, California 93101  
(ea w/c encls)

Hand Deliver to the Following Bureau of Reclamation Area Offices' Addresses:

Ms. Barbara Hidleburg, SCC-415

Phone number: 559-487-5063

Ms. Sheryl Carter, SCC-414

Phone number: 559-487-5299

Bureau of Reclamation

1243 N Street

Fresno, CA 93721-1813

Ms. Eileen Jones, TO-440

Phone number: 209-836-6271

Bureau of Reclamation

16650 Kelso Road

Byron, CA 94514-1909

Mr. Don Bultema, NC-440

Phone number: 700-450-7361

Bureau of Reclamation

1140 West Wood Street

Willows, CA 95988

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
Central Valley Project, California

LONG-TERM RENEWAL CONTRACT BETWEEN THE UNITED STATES  
AND  
CITY OF FRESNO  
PROVIDING FOR PROJECT WATER SERVICE  
FROM FRIANT DIVISION

Table of Contents

<u>Article No.</u>	<u>Title</u>	<u>Page No.</u>
	Preamble .....	1
	Explanatory Recitals .....	2-5
1	Definitions.....	5-10
2	Term of Contract.....	10-12
3	Water to be Made Available and Delivered to the Contractor.....	12-17
4	Time for Delivery of Water.....	18-20
5	Point of Diversion and Responsibility for Distribution of Water.....	20-22
6	Measurement of Water Within the Contractor's Service Area.....	22-24
7	Rates and Method of Payment for Water.....	24-30
8	Omitted .....	30
9	Sales, Transfers, or Exchanges of Water .....	30-32
10	Application of Payments and Adjustments.....	32-33
11	Temporary Reductions--Return Flows.....	33-34
12	Constraints on the Availability of Water .....	34-36
13	Omitted .....	37
14	Rules and Regulations.....	37
15	Water and Air Pollution Control.....	37
16	Quality of Water.....	37-38
17	Water Acquired by the Contractor Other Than From the United States.....	38-39
18	Opinions and Determinations .....	40
19	Coordination and Cooperation.....	40-42
20	Charges for Delinquent Payments.....	42

Table of Contents - continued

<u>Article No.</u>	<u>Title</u>	<u>Page No.</u>
21	Equal Opportunity.....	43-44
22	General Obligation--Benefits Conditioned Upon Payment .....	44
23	Compliance With Civil Rights Laws and Regulations .....	44-45
24	Omitted .....	45
25	Contractor to Pay Certain Miscellaneous Costs.....	45
26	Water Conservation .....	45-47
27	Existing or Acquired Water or Water Rights.....	47
28	Operation and Maintenance by Operating Non-Federal Entity.....	47-49
29	Contingent on Appropriation or Allotment of Funds .....	49
30	Books, Records, and Reports.....	49-50
31	Assignment Limited--Successors and Assigns Obligated.....	50
32	Severability .....	51
33	Resolution of Disputes.....	51-52
34	Officials Not to Benefit.....	52
35	Changes in Contractor's Service Area .....	52
36	Federal Laws .....	53
37	Notices .....	53
38	Confirmation of Contract.....	53
	Signature Page.....	54

Exhibit A - Map of Contractor's Service Area

Exhibit B - Rates and Charges

Exhibit C - Metering Plan

1 UNITED STATES  
2 DEPARTMENT OF THE INTERIOR  
3 BUREAU OF RECLAMATION  
4 Central Valley Project, California

5 LONG-TERM RENEWAL CONTRACT BETWEEN THE UNITED STATES  
6 AND  
7 CITY OF FRESNO  
8 PROVIDING FOR PROJECT WATER SERVICE  
9 FROM FRIANT DIVISION

10 THIS CONTRACT, made this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, in pursuance  
11 generally of the Act of June 17, 1902 (32 Stat. 388), and acts amendatory or supplementary thereto,  
12 including, but not limited to, the Acts of August 26, 1937 (50 Stat. 844), as amended and  
13 supplemented, August 4, 1939 (53 Stat. 1187), as amended and supplemented, July 2, 1956 (70 Stat.  
14 483), June 21, 1963 (77 Stat. 68), October 12, 1982 (96 Stat. 1263), October 27, 1986 (100 Stat.  
15 3050), as amended, and Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706), all collectively  
16 hereinafter referred to as Federal Reclamation law, between THE UNITED STATES OF AMERICA,  
17 hereinafter referred to as the United States, and CITY OF FRESNO, hereinafter referred to as the  
18 Contractor, a public agency of the State of California, duly organized, existing, and acting pursuant to  
19 the laws thereof;

20 WITNESSETH, That:

EXPLANATORY RECITALS

21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41

[1<sup>st</sup>] WHEREAS, the United States has constructed and is operating the Central Valley Project (Project), California, for diversion, storage, carriage, distribution and beneficial use, for flood control, irrigation, municipal, domestic, industrial, fish and wildlife mitigation, protection and restoration, generation and distribution of electric energy, salinity control, navigation and other beneficial uses, of waters of the Sacramento River, the American River, the Trinity River, and the San Joaquin River and their tributaries; and

[2<sup>nd</sup>] WHEREAS, the United States constructed Friant Dam (thereby creating Millerton Lake) and the Friant-Kern and Madera Canals, hereinafter collectively referred to as the Friant Division facilities, which will be used in part for the furnishing of water to the Contractor pursuant to the terms of this Contract; and

[3<sup>rd</sup>] WHEREAS, pursuant to Section 8 of the Act of June 17, 1902 (32 Stat. 388), the United States has acquired water rights and other rights to the flows of the San Joaquin River, including without limitation the permits issued as the result of Decision 935 by the California State Water Resources Control Board and the contracts described in subdivision (n) of Article 3 of this Contract, pursuant to which the Contracting Officer develops, diverts, stores and delivers Project Water stored or flowing through Millerton Lake in accordance with State and Federal law for the benefit of Project Contractors in the Friant Division; and

[3.1] WHEREAS, the water supplied to the Contractor pursuant to this Contract is Project Water developed through the exercise of the rights described in the third Explanatory Recital of this Contract; and

42 [4<sup>th</sup>] WHEREAS, the Contractor and the United States entered into Contract  
43 No. 14-06-200-8901, which established terms for the delivery to the Contractor of Project Water from  
44 the Friant Division from March 1, 1966, to February 28, 2006, hereinafter referred to as the Existing  
45 Contract; and

46 [5<sup>th</sup>] WHEREAS, the Contractor and the United States have, pursuant to Subsection  
47 3404(c)(3) of the Central Valley Project Improvement Act (CVPIA), subsequently entered into a  
48 -Binding Agreement identified as Binding Agreement No. 14-06-200-8901-BA, which sets out the  
49 terms pursuant to which the Contractor agreed to renew the Existing Contract before its expiration  
50 date after completion of the programmatic environmental impact statement and other appropriate  
51 environmental documentation and negotiation of a renewal contract, and which also sets out the  
52 consequences of a subsequent decision not to renew; and

53 [6<sup>th</sup>] WHEREAS, Section 3404(c) of the CVPIA provides for long-term renewal of the  
54 Existing Contract following completion of appropriate environmental documentation, including a  
55 programmatic environmental impact statement (PEIS) pursuant to the National Environmental Policy  
56 Act (NEPA) analyzing the direct and indirect impacts and benefits of implementing the CVPIA and  
57 the potential renewal of all existing contracts for Project Water; and

58 [7<sup>th</sup>] WHEREAS, the United States has completed the PEIS and all other appropriate  
59 environmental review necessary to provide for long-term renewal of the Existing Contract; and

60 [8<sup>th</sup>] WHEREAS, the Contractor has requested the long-term renewal of the Existing  
61 Contract, pursuant to the terms of the Existing Contract, Federal Reclamation law, and the laws of the  
62 State of California, for water service from the Project; and

63 [9<sup>th</sup>] WHEREAS, the United States has determined that the Contractor has fulfilled all of  
64 its obligations under the Existing Contract; and

65 [10<sup>th</sup>] WHEREAS, the Contractor has demonstrated to the satisfaction of the Contracting  
66 Officer that the Contractor has utilized the Project Water supplies available to it for reasonable and  
67 beneficial use and/or has demonstrated projected future demand for water use such that the Contractor  
68 has the capability and expects to utilize fully for reasonable and beneficial use the quantity of Project  
69 Water to be made available to it pursuant to this Contract; and

70 [11<sup>th</sup>] WHEREAS, water obtained from the Project has been relied upon by urban and  
71 agricultural areas within California for more than 50 years, and is considered by the Contractor as an  
72 essential portion of its water supply; and

73 [12<sup>th</sup>] WHEREAS, the economies of regions within the Project, including the Contractor's,  
74 depend upon the continued availability of water, including water service from the Project; and

75 [13<sup>th</sup>] WHEREAS, the Secretary intends through coordination, cooperation, and partnerships  
76 to pursue measures to improve water supply, water quality, and reliability of the Project for all Project  
77 purposes; and

78 [14<sup>th</sup>] WHEREAS, the mutual goals of the United States and the Contractor include: to  
79 provide for reliable Project Water supplies; to control costs of those supplies; to achieve repayment of  
80 the Project as required by law; to guard reasonably against Project Water shortages; to achieve a  
81 reasonable balance among competing demands for use of Project Water; and to comply with all  
82 applicable environmental statutes, all consistent with the legal obligations of the United States  
83 relative to the Project; and

84 [15<sup>th</sup>] WHEREAS, the parties intend by this Contract to develop a more cooperative  
85 relationship in order to achieve their mutual goals; and

86 [15.1] WHEREAS, during uncontrolled seasons, Friant Division Project Contractors utilize  
87 undependable Class 2 Water in their service areas to, among other things, assist in the management  
88 and alleviation of groundwater overdraft in the Friant Division service area, provide opportunities for  
89 environmental enhancement, including restoration of the San Joaquin River below Friant Dam,  
90 minimize flooding along the San Joaquin River, encourage optimal water management, and maximize  
91 the reasonable and beneficial use of the water; and

92 [15.2] WHEREAS, the parties desire and intend that this Contract not provide a disincentive  
93 to the Friant Division Project Contractors continuing to carry out the beneficial activities set out in  
94 the Explanatory Recital immediately above; and

95 [16<sup>th</sup>] WHEREAS, the United States and the Contractor are willing to enter into this  
96 Contract pursuant to Federal Reclamation law on the terms and conditions set forth below;

97 NOW, THEREFORE, in consideration of the mutual and dependent covenants herein  
98 contained, it is hereby mutually agreed by the parties hereto as follows:

99 DEFINITIONS

100 1. When used herein unless otherwise distinctly expressed, or manifestly incompatible  
101 with the intent of the parties as expressed in this Contract, the term:

102 (a) "Calendar Year" shall mean the period January 1 through December 31, both  
103 dates inclusive;

104                   (b)    "Charges" shall mean the payments required by Federal Reclamation law in  
105 addition to the Rates and Tiered Pricing Component specified in this Contract as determined annually  
106 by the Contracting Officer pursuant to this Contract;

107                   (b2)   "Class 1 Water" shall mean that supply of water stored in or flowing through  
108 Millerton Lake which, subject to the contingencies hereinafter described in Articles 3, 11, and 12 of  
109 this Contract, will be available for delivery from Millerton Lake and the Friant-Kern and Madera  
110 Canals as a dependable water supply during each Year;

111                   (b3)   "Class 2 Water" shall mean that supply of water which can be made available  
112 subject to the contingencies hereinafter described in Articles 3, 11, and 12 of this Contract for  
113 delivery from Millerton Lake and the Friant-Kern and Madera Canals in addition to the supply of  
114 Class 1 Water. Because of its uncertainty as to availability and time of occurrence, such water will be  
115 undependable in character and will be furnished only if, as, and when it can be made available as  
116 determined by the Contracting Officer;

117                   (c)    "Condition of Shortage" shall mean a condition respecting the Project during  
118 any Year such that the Contracting Officer is unable to deliver sufficient water to meet the Contract  
119 Total;

120                   (d)    "Contracting Officer" shall mean the Secretary of the Interior's duly authorized  
121 representative acting pursuant to this Contract or applicable Federal Reclamation law or regulation;

122                   (e)    "Contract Total" shall mean the maximum amount of Class 1 Water, plus the  
123 maximum amount of Class 2 Water to which the Contractor is entitled under subdivision (a) of  
124 Article 3 of this Contract;

125 (f) "Contractor's Service Area" shall mean the area to which the Contractor is  
126 permitted to provide Project Water under this Contract as described in Exhibit "A" attached hereto,  
127 which may be modified from time to time in accordance with Article 35 of this Contract without  
128 amendment of this Contract;

129 (g) "CVPIA" shall mean the Central Valley Project Improvement Act, Title  
130 XXXIV of the Act of October 30, 1992 (106 Stat. 4706);

131 (h-i) Omitted;

132 (j) "Full Cost Rate" shall mean an annual rate as determined by the Contracting  
133 Officer that shall amortize the expenditures for construction properly allocable to the Project  
134 irrigation or M&I functions, as appropriate, of facilities in service including all O&M deficits funded,  
135 less payments, over such periods as may be required under Federal Reclamation law or applicable  
136 contract provisions. Interest will accrue on both the construction expenditures and funded O&M  
137 deficits from October 12, 1982, on costs outstanding at that date, or from the date incurred in the case  
138 of costs arising subsequent to October 12, 1982, and shall be calculated in accordance with  
139 subsections 202(3)(B) and (3)(C) of the RRA. The Full Cost Rate includes actual operation,  
140 maintenance, and replacement costs consistent with Section 426.2 of the Rules and Regulations for  
141 the RRA;

142 (k-l) Omitted;

143 (m) "Irrigation Water" shall mean water made available from the Project that is  
144 used primarily in the production of agricultural crops or livestock, including domestic use incidental  
145 thereto, and watering of livestock;

146 (n) Omitted;

147 (n2) "Long Term Historic Average" shall mean the average of the final forecast of  
148 Water Made Available to the Contractor pursuant to this Contract and the contract referenced in the  
149 fourth Explanatory Recital of this Contract;

150 (o) "Municipal and Industrial (M&I) Water" shall mean Project Water, other than  
151 Irrigation Water, made available to the Contractor. M&I Water shall include water used for human  
152 use and purposes such as the watering of landscaping or pasture for animals (e.g., horses) which are  
153 kept for personal enjoyment or water delivered to land holdings operated in units of less than five  
154 acres unless the Contractor establishes to the satisfaction of the Contracting Officer that the use of  
155 water delivered to any such landholding is a use described in subdivision (m) of this Article;

156 (p) "M&I Full Cost Water Rate" shall mean the Full Cost Rate applicable to the  
157 delivery of M&I Water;

158 (q) "Operation and Maintenance" or "O&M" shall mean normal and reasonable  
159 care, control, operation, repair, replacement (other than capital replacement), and maintenance of  
160 Project facilities;

161 (r) "Operating Non-Federal Entity" shall mean the Friant Water Authority, its  
162 successors or assigns, a non-Federal entity which has the obligation to operate and maintain all or a  
163 portion of the Friant Division facilities pursuant to an agreement with the United States, and which  
164 may have funding obligations with respect thereto;

165 (s) "Project" shall mean the Central Valley Project owned by the United States and  
166 managed by the Department of the Interior, Bureau of Reclamation;

167 (t) "Project Contractors" shall mean all parties who have water service contracts  
168 for Project Water from the Project with the United States pursuant to Federal Reclamation law;

169 (u) "Project Water" shall mean all water that is developed, diverted, stored, or  
170 delivered by the Secretary in accordance with the statutes authorizing the Project and in accordance  
171 with the terms and conditions of water rights acquired pursuant to California law;

172 (v) "Rates" shall mean the payments determined annually by the Contracting  
173 Officer in accordance with the then-current applicable water ratesetting policies for the Project, as  
174 described in subdivision (a) of Article 7 of this Contract;

175 (w) Omitted;

176 (x) "Secretary" shall mean the Secretary of the Interior, a duly appointed successor,  
177 or an authorized representative acting pursuant to any authority of the Secretary and through any  
178 agency of the Department of the Interior;

179 (y) "Tiered Pricing Component" shall be the incremental amount to be paid for  
180 each acre-foot of Water Delivered as described in subdivision (j) of Article 7 of this Contract;

181 (z) "Water Delivered" or "Delivered Water" shall mean Project Water diverted for  
182 use by the Contractor at the point(s) of delivery approved by the Contracting Officer;

183 (aa) "Water Made Available" shall mean the estimated amount of Project Water that  
184 can be delivered to the Contractor for the upcoming Year as declared by the Contracting Officer,  
185 pursuant to subdivision (a) of Article 4 of this Contract;

186 (bb) "Water Scheduled" shall mean Project Water made available to the Contractor  
187 for which times and quantities for delivery have been established by the Contractor and Contracting  
188 Officer, pursuant to subdivision (b) of Article 4 of this Contract; and

189 (cc) "Year" shall mean the period from and including March 1 of each Calendar  
190 Year through the last day of February of the following Calendar Year.

191 - TERM OF CONTRACT

192 2. (a) This Contract shall be effective March 1, 2005, through February 28, 2045, and  
193 supersedes the Existing Contract. In the event the Contractor wishes to renew this Contract beyond  
194 February 28, 2045, the Contractor shall submit a request for renewal in writing to the Contracting  
195 Officer no later than two years prior to the date this Contract expires.

196 (b) Omitted.

197 (c) Provided, the Contractor is complying with all terms and conditions of this  
198 Contract and all legal obligations of the Contractor, if any, set forth in an enforceable court order,  
199 final judgment and/or settlement relating to restoration of the San Joaquin River, this Contract shall  
200 be renewed for successive periods of up to 40 years each, which periods shall be consistent with the  
201 then-existing Reclamation-wide policy, under terms and conditions mutually agreeable to the parties  
202 and consistent with Federal and State law. The Contractor shall be afforded the opportunity to  
203 comment to the Contracting Officer on the proposed adoption and application of any revised policy  
204 applicable to the delivery of M&I Water that would limit the term of any subsequent renewal contract  
205 with the Contractor for the furnishing of M&I Water to less than 40 years.

206                   (d)     The Contracting Officer shall make a determination ten years after the date of  
207     execution of this Contract, and every five years thereafter during the term of this Contract, of whether  
208     a conversion to a contract under subsection 9(c)(1) of the Reclamation Project Act of 1939 can be  
209     accomplished. The Contracting Officer anticipates that during the term of this Contract, all authorized  
210     Project construction expected to occur will have occurred, and on that basis the Contracting Officer  
211     agrees upon such completion to allocate all costs that are properly assignable to the Contractor, and  
212     agrees further that, at any time after such allocation is made, and subject to satisfaction of the  
213     conditions set out in this subdivision, this Contract shall, at the request of the Contractor, be  
214     converted to a contract under subsection 9(c)(1) of the Reclamation Project Act of 1939, subject to  
215     applicable Federal law and under stated terms and conditions mutually agreeable to the Contractor  
216     and the Contracting Officer. A condition for such conversion to occur shall be a determination by the  
217     Contracting Officer that, account being taken of the amount credited to return by the Contractor as  
218     provided for under Federal Reclamation law, the remaining amount of construction costs assignable  
219     for ultimate return by the Contractor can probably be repaid to the United States within the term of a  
220     contract under subsection 9(c)(1). If the remaining amount of costs that are properly assignable to the  
221     Contractor cannot be determined during the term of this Contract, the Contracting Officer shall notify  
222     the Contractor, and provide the reason(s) why such a determination could not be made. Further, the  
223     Contracting Officer shall make such a determination as soon thereafter as possible so as to permit,  
224     upon request of the Contractor and satisfaction of the conditions set out above, conversion to a  
225     contract under subsection 9(c)(1). In the event such determination of costs has not been made at a  
226     time which allows conversion of this Contract during the term of this Contract or the Contractor has

227 not requested conversion of this Contract within such term, the parties shall incorporate in any  
228 subsequent renewal contract as described in subdivision (c) of this Article a provision that carries  
229 forth in substantially identical terms the provisions of this subdivision.

230 WATER TO BE MADE AVAILABLE AND DELIVERED TO THE CONTRACTOR

231 3. (a) During each Year, consistent with all applicable State water rights, permits,  
232 and licenses, Federal law, and subject to the provisions set forth in Articles 11 and 12 of this  
233 Contract, the Contracting Officer shall make available for delivery to the Contractor 60,000 acre-feet  
234 of Class 1 Water for M&I purposes. Water Delivered to the Contractor in accordance with this  
235 subdivision shall be scheduled and paid for pursuant to the provisions of Articles 4 and 7 of this  
236 Contract.

237 (b) Omitted.

238 (c) The Contractor shall utilize the Project Water in accordance with all applicable  
239 legal requirements.

240 (d) The Contractor shall make reasonable and beneficial use of all water furnished  
241 pursuant to this Contract. Groundwater recharge programs (direct, indirect, or in lieu), groundwater  
242 banking programs, surface water storage programs, and other similar programs utilizing Project  
243 Water or other water furnished pursuant to this Contract conducted within the Contractor's Service  
244 Area which are consistent with applicable State law and result in use consistent with Federal  
245 Reclamation law will be allowed; Provided, That any direct recharge program(s) is (are) described in  
246 the Contractor's water conservation plan submitted pursuant to Article 26 of this Contract; Provided  
247 further, That such water conservation plan demonstrates sufficient lawful uses exist in the

248 Contractor's Service Area so that using a long-term average, the quantity of Delivered Water is  
249 demonstrated to be reasonable for such uses and in compliance with Federal Reclamation law.  
250 Groundwater recharge programs, groundwater banking programs, surface water storage programs,  
251 and other similar programs utilizing Project Water or other water furnished pursuant to this Contract  
252 conducted outside the Contractor's Service Area may be permitted upon written approval of the  
253 Contracting Officer, which approval will be based upon environmental documentation, Project Water  
254 rights, and Project operational concerns. The Contracting Officer will address such concerns in  
255 regulations, policies, or guidelines.

256 (e) The Contractor shall comply with requirements applicable to the Contractor in  
257 biological opinion(s) prepared as a result of a consultation regarding the execution of this Contract  
258 undertaken pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended, that are  
259 within the Contractor's legal authority to implement. The Existing Contract, which evidences in  
260 excess of 39 years of diversions for M&I purposes of the quantities of water provided in subdivision  
261 (a) of Article 3 of this Contract, will be considered in developing an appropriate baseline for the  
262 biological assessment(s) prepared pursuant to the ESA, and any other needed environmental review.  
263 Nothing herein shall be construed to prevent the Contractor from challenging or seeking judicial relief  
264 in a court of competent jurisdiction with respect to any biological opinion or other environmental  
265 documentation referred to in this Article.

266 (f) Subject to subdivisions (l) and (n) of Article 3 of this Contract, following the  
267 declaration of Water Made Available under Article 4 of this Contract, the Contracting Officer will  
268 make a determination whether Project Water, or other water available to the Project, can be made

269 available to the Contractor in addition to the Contract Total under Article 3 of this Contract during  
270 the Year without adversely impacting other Project Contractors. At the request of the Contractor, the  
271 Contracting Officer will consult with the Contractor prior to making such a determination. Subject to  
272 subdivisions (l) and (n) of Article 3 of this Contract, if the Contracting Officer determines that Project  
273 Water, or other water available to the Project, can be made available to the Contractor, the  
274 Contracting Officer will announce the availability of such water and shall so notify the Contractor as  
275 soon as practicable. The Contracting Officer will thereafter meet with the Contractor and other  
276 Project Contractors capable of taking such water to determine the most equitable and efficient  
277 allocation of such water. If the Contractor requests the delivery of any quantity of such water, the  
278 Contracting Officer shall make such water available to the Contractor in accordance with applicable  
279 statutes, regulations, guidelines, and policies.

280 (g) The Contractor may request permission to reschedule for use during the  
281 subsequent Year some or all of the Water Made Available to the Contractor during the current Year  
282 referred to as "carryover." The Contractor may request permission to use during the current Year a  
283 quantity of Project Water which may be made available by the United States to the Contractor during  
284 the subsequent Year referred to as "preuse." The Contracting Officer's written approval may permit  
285 such uses in accordance with applicable statutes, regulations, guidelines, and policies.

286 (h) The Contractor's right pursuant to Federal Reclamation law and applicable  
287 State law to the reasonable and beneficial use of Water Delivered pursuant to this Contract during the  
288 term thereof and any subsequent renewal contracts, as described in Article 2 of this Contract, during  
289 the terms thereof shall not be disturbed so long as the Contractor shall fulfill all of its obligations

290 under this Contract and any renewals thereof. Nothing in the preceding sentence shall affect the  
291 Contracting Officer's ability to impose shortages under Article 11 or subdivision (b) of Article 12 of  
292 this Contract or applicable provisions of any subsequent renewal contracts.

293 (i) Project Water furnished to the Contractor pursuant to this Contract may be  
294 delivered for other than M&I purposes upon written approval by the Contracting Officer in  
295 accordance with the terms and conditions of such approval.

296 (j) The Contracting Officer shall make reasonable efforts to protect the water  
297 rights and other rights described in the third Explanatory Recital of this Contract necessary for the  
298 Project and to provide the water available under this Contract. The Contracting Officer shall not  
299 object to participation by the Contractor, in the capacity and to the extent permitted by law, in  
300 administrative proceedings related to the water rights and other rights described in the third  
301 Explanatory Recital of this Contract; Provided, That the Contracting Officer retains the right to object  
302 to the substance of the Contractor's position in such a proceeding; Provided further, That in such  
303 proceedings the Contracting Officer shall recognize the Contractor has a legal right under the terms of  
304 this Contract to use Project Water.

305 (k) Project Water furnished to the Contractor during any month designated in a  
306 schedule or revised schedule submitted by the Contractor and approved by the Contracting Officer  
307 shall be deemed to have been accepted by the Contractor as Class 1 Water to the extent that Class 1  
308 Water is called for in such schedule for such month and shall be deemed to have been accepted as  
309 Class 2 Water to the extent Class 2 Water is called for in such schedule for such month. If in any  
310 month the Contractor diverts a quantity of water in addition to the total amount of Class 1 Water and

311 Class 2 Water set forth in the Contractor's approved schedule or revised schedule for such month,  
312 such additional diversions shall be charged first against the Contractor's remaining Class 2 Water  
313 supply available in the current Year. To the extent the Contractor's remaining Class 2 Water supply  
314 available in the current Year is not sufficient to account for such additional diversions, such  
315 additional diversions shall be charged against the Contractor's remaining Class 1 Water supply  
316 available in the current Year. To the extent the Contractor's remaining Class 1 Water and Class 2  
317 Water supplies available in the current Year are not sufficient to account for such additional  
318 diversions, such additional diversions shall be charged first against the Contractor's available Class 2  
319 Water supply and then against the Contractor's available Class 1 Water supply, both for the following  
320 Year. Payment for all additional diversions of water shall be made in accordance with Article 7 of  
321 this Contract.

322 (1) If the Contracting Officer determines there is a Project Water supply available  
323 at Friant Dam as the result of an unusually large water supply not otherwise storable for Project  
324 purposes or infrequent and otherwise unmanaged flood flows of short duration, such water will be  
325 made available to the Contractor and others under Section 215 of the RRA pursuant to the priorities  
326 specified below if the Contractor enters into a temporary contract with the United States not to exceed  
327 one (1) year for the delivery of such water or, as otherwise provided for in Federal Reclamation law  
328 and associated regulations. Such water may be identified by the Contractor either (i) as additional  
329 water to supplement the supply of Class 1 Water and/or Class 2 Water made available to it pursuant  
330 to this Contract or, (ii) upon written notification to the Contracting Officer, as water to be credited  
331 against the Contractor's Class 2 Water supply available pursuant to this Contract. The Contracting

332 Officer shall make water determined to be available pursuant to this subsection according to the  
333 following priorities: first, to long-term contractors for Class 1 Water and/or Class 2 Water within the  
334 Friant Division; second, to long-term contractors in the Cross Valley Division of the Project. The  
335 Contracting Officer will consider and seek to accommodate requests from other parties for Section  
336 215 Water for use within the area identified as the Friant Division service area in the environmental  
337 assessment developed in connection with the execution of this Contract.

338 (m) Nothing in this Contract, nor any action or inaction of the Contractor or  
339 Contracting Officer in connection with the implementation of this Contract, is intended to override,  
340 modify, supersede or otherwise interfere with any term or condition of the water rights and other  
341 rights referred in the third Explanatory Recital of this Contract.

342 (n) The rights of the Contractor under this Contract are subject to the terms of the  
343 contract for exchange waters, dated July 27, 1939, between the United States and the San Joaquin and  
344 Kings River Canal and Irrigation Company, Incorporated, et al., (hereinafter referred to as the  
345 Exchange Contractors), Contract No. 11r-1144, as amended. The United States agrees that it will not  
346 deliver to the Exchange Contractors thereunder waters of the San Joaquin River unless and until  
347 required by the terms of said contract, and the United States further agrees that it will not voluntarily  
348 and knowingly determine itself unable to deliver to the Exchange Contractors entitled thereto from  
349 water that is available or that may become available to it from the Sacramento River and its  
350 tributaries or the Sacramento-San Joaquin Delta those quantities required to satisfy the obligations of  
351 the United States under said Exchange Contract and under Schedule 2 of the Contract for Purchase of  
352 Miller and Lux Water Rights (Contract No. 11r-1145, dated July 27, 1939).

353

TIME FOR DELIVERY OF WATER

354

4. (a) On or about February 20 of each Calendar Year, the Contracting Officer shall

355

announce the Contracting Officer's expected declaration of the Water Made Available. Such

356

declaration will be expressed in terms of both Water Made Available and the Long Term Historic

357

Average and will be updated monthly, and more frequently if necessary, based on then-current

358

operational and hydrologic conditions and a new declaration with changes, if any, to the Water Made

359

Available will be made. The Contracting Officer shall provide forecasts of Project operations and the

360

basis of the estimate, with relevant supporting information, upon the written request of the

361

Contractor. Concurrently with the declaration of the Water Made Available, the Contracting Officer

362

shall provide the Contractor with the updated Long Term Historic Average.

363

(b) On or before each March 1 and at such other times as necessary, the Contractor

364

shall submit to the Contracting Officer a written schedule, satisfactory to the Contracting Officer,

365

showing the monthly quantities of Project Water to be delivered by the United States to the

366

Contractor pursuant to this Contract for the Year commencing on such March 1. The Contracting

367

Officer shall use all reasonable means to deliver Project Water according to the approved schedule for

368

the Year commencing on such March 1.

369

(c) The Contractor shall not schedule Project Water in excess of the quantity of

370

Project Water the Contractor intends to put to reasonable and beneficial use within the Contractor's

371

Service Area or to sell, transfer or exchange pursuant to Article 9 of this Contract during any Year.

372

(d) Subject to the conditions set forth in subdivision (a) of Article 3 of this

373

Contract, the United States shall deliver Project Water to the Contractor in accordance with the initial

374 schedule submitted by the Contractor pursuant to subdivision (b) of this Article, or any written  
375 revision(s), satisfactory to the Contracting Officer, thereto submitted within a reasonable time prior to  
376 the date(s) on which the requested change(s) is/are to be implemented; Provided, That the total  
377 amount of water requested in that schedule or revision does not exceed the quantities announced by  
378 the Contracting Officer pursuant to the provisions of subdivision (a) of Article 3, and the Contracting  
379 Officer determines that there will be sufficient capacity available in the appropriate Friant Division  
380 facilities to deliver the water in accordance with that schedule; Provided further, That the Contractor  
381 shall not schedule the delivery of any water during any period as to which the Contractor is notified  
382 by the Contracting Officer or Operating Non-Federal Entity that Project facilities required to make  
383 deliveries to the Contractor will not be in operation because of scheduled O&M.

384 (e) The Contractor may, during the period from and including November 1 of each  
385 Year through and including the last day of February of that Year, request delivery of any amount of  
386 the Class 1 Water estimated by the Contracting Officer to be made available to it during the following  
387 Year. The Contractor may, during the period from and including January 1 of each Year (or such  
388 earlier date as may be determined by the Contracting Officer) through and including the last day of  
389 February of that Year, request delivery of any amount of Class 2 Water estimated by the Contracting  
390 Officer to be made available to it during the following Year. Such water shall hereinafter be referred  
391 to as preuse water. Such request must be submitted in writing by the Contractor for a specified  
392 quantity of preuse and shall be subject to the approval of the Contracting Officer. Payment for preuse  
393 water so requested shall be at the appropriate rate(s) for the following Year in accordance with  
394 Article 7 of this Contract and shall be made in advance of delivery of any preuse water. The

395 Contracting Officer shall deliver such preuse water in accordance with a schedule or any revision  
396 thereof submitted by the Contractor and approved by the Contracting Officer, to the extent such water  
397 is available and to the extent such deliveries will not interfere with the delivery of Project Water  
398 entitlements to other Friant Division contractors or the physical maintenance of the Project facilities.  
399 The quantities of preuse water delivered pursuant to this subdivision shall be deducted from the  
400 quantities of water that the Contracting Officer would otherwise be obligated to make available to the  
401 Contractor during the following Year; Provided, That the quantity of preuse water to be deducted  
402 from the quantities of either Class 1 Water or Class 2 Water to be made available to the Contractor in  
403 the following Year shall be specified by the Contractor at the time the preuse water is requested or as  
404 revised in its first schedule for the following Year submitted in accordance with subdivision (b) of  
405 this Article, based on the availability of the following Year water supplies as determined by the  
406 Contracting Officer.

407 POINT OF DIVERSION AND RESPONSIBILITY FOR DISTRIBUTION OF WATER

408 5. (a) Project Water scheduled pursuant to subdivision (b) of Article 4 of this  
409 Contract shall be delivered to the Contractor at a point or points of delivery either on Project facilities  
410 or another location or locations mutually agreed to in writing by the Contracting Officer and the  
411 Contractor.

412 (b) The Contracting Officer, either directly or through its written agreement(s)  
413 with the Operating Non-Federal Entity, shall make all reasonable efforts to maintain sufficient flows  
414 and levels of water in the Friant-Kern Canal to deliver Project Water to the Contractor at specific  
415 turnouts established pursuant to subdivision (a) of this Article.

416                   (c)     The Contractor shall not deliver Project Water to land outside the Contractor's  
417 Service Area unless approved in advance by the Contracting Officer.

418                   (d)     All Water Delivered to the Contractor pursuant to this Contract shall be  
419 measured and recorded with equipment furnished, installed, operated, and maintained by the United  
420 States or the Operating Non-Federal Entity at the point or points of delivery established pursuant to  
421 subdivision (a) of this Article. Upon the request of either party to this Contract, the Contracting  
422 Officer shall investigate, or cause to be investigated by the appropriate Operating Non-Federal Entity,  
423 the accuracy of such measurements and shall take any necessary steps to adjust any errors appearing  
424 therein. For any period of time when accurate measurements have not been made, the Contracting  
425 Officer shall consult with the Contractor and the responsible Operating Non-Federal Entity prior to  
426 making a final determination of the quantity delivered for that period of time.

427                   (e)     Neither the Contracting Officer nor any Operating Non-Federal Entity shall be  
428 responsible for the control, carriage, handling, use, disposal, or distribution of Water Delivered to the  
429 Contractor pursuant to this Contract beyond the delivery points specified in subdivision (a) of this  
430 Article. The Contractor shall indemnify the United States, its officers, employees, agents, and assigns  
431 on account of damage or claim of damage of any nature whatsoever for which there is legal  
432 responsibility, including property damage, personal injury, or death arising out of or connected with  
433 the control, carriage, handling, use, disposal, or distribution of such Project Water Delivered beyond  
434 such delivery points, except for any damage or claim arising out of: (i) acts or omissions of the  
435 Contracting Officer or any of its officers, employees, agents, or assigns, including the Operating  
436 Non-Federal Entity, with the intent of creating the situation resulting in any damage or claim;

437 (ii) willful misconduct of the Contracting Officer or any of its officers, employees, agents, or assigns,  
438 including the Operating Non-Federal Entity; (iii) negligence of the Contracting Officer or any of its  
439 officers, employees, agents, or assigns including the Operating Non-Federal Entity; or (iv) damage or  
440 claims resulting from a malfunction of facilities owned and/or operated by the United States or  
441 responsible Operating Non-Federal Entity.

442 MEASUREMENT OF WATER WITHIN THE CONTRACTOR'S SERVICE AREA

443 6. (a) Within five years of the date of Contract execution, the Contractor will have an  
444 established measuring program satisfactory to the Contracting Officer. The Contractor shall ensure  
445 that all surface water delivered for M&I purposes is measured at each M&I service connection. The  
446 water measuring devices or water measuring methods of comparable effectiveness must be acceptable  
447 to the Contracting Officer. The Contractor shall be responsible for installing, operating, and  
448 maintaining and repairing all such measuring devices and implementing all such water measuring  
449 methods at no cost to the United States. The Contracting Officer acknowledges that the Contractor  
450 has a metering plan (Exhibit "C") setting forth the milestones and schedule that the Contractor will  
451 implement to comply with the requirements of this Article. Beginning January 2006, the Contractor  
452 shall provide an annual written report to the Contracting Officer describing the Contractor's metering  
453 plan implementation progress. The Contractor shall use the information obtained from such water  
454 measuring devices or water measuring methods to ensure its proper management of the water, to bill  
455 water users for water delivered by the Contractor; and, if applicable, to record water delivered for  
456 M&I purposes by customer class as defined in the Contractor's water conservation plan provided for  
457 in Article 26 of this Contract. Nothing herein contained, however, shall preclude the Contractor from

458 establishing and collecting any charges, assessments, or other revenues authorized by California law.  
459 The Contractor shall include a summary of all its annual surface water deliveries in the annual report  
460 described in subdivision (c) of Article 26.

461 (b) To the extent the information has not otherwise been provided, upon execution  
462 of this Contract, the Contractor shall provide to the Contracting Officer a written report describing the  
463 measurement devices or water measuring methods being used or to be used to implement subdivision  
464 (a) of this Article and identifying the M&I service connections or alternative measurement programs  
465 approved by the Contracting Officer, at which such measurement devices or water measuring  
466 methods are being used, and, if applicable, identifying the locations at which such devices and/or  
467 methods are not yet being used including a time schedule for implementation at such locations. The  
468 Contracting Officer shall advise the Contractor in writing within 60 days as to the adequacy, and  
469 necessary modifications, if any, of the measuring devices or water measuring methods identified in  
470 the Contractor's report and if the Contracting Officer does not respond in such time, they shall be  
471 deemed adequate. If the Contracting Officer notifies the Contractor that the measuring devices or  
472 methods are inadequate, the parties shall within 60 days following the Contracting Officer's response,  
473 negotiate in good faith the earliest practicable date by which the Contractor shall modify said  
474 measuring devices and/or measuring methods as required by the Contracting Officer to ensure  
475 compliance with subdivision (a) of this Article.

476 (c) All new surface water delivery systems installed within the Contractor's  
477 Service Area after the effective date of this Contract shall also comply with the measurement

478 provisions described in subdivision (a) of this Article.

479 (d) The Contractor shall inform the Contracting Officer and the State of California  
480 in writing by April 30 of each Year of the monthly volume of surface water delivered within the  
481 Contractor's Service Area during the previous Year.

482 (e) The Contractor shall inform the Contracting Officer and the Operating  
483 Non-Federal Entity on or before the 20<sup>th</sup> calendar day of each month of the quantity of M&I Water  
484 taken during the preceding month.

485 (f) In the event the provisions of subdivision (a) of this Article or any portion  
486 thereof, are challenged in a judicial proceeding, the parties agree to meet and confer promptly and as  
487 often as necessary to employ their reasonable best efforts to coordinate their response to the challenge  
488 and, as appropriate, develop revisions to this Contract.

489 RATES AND METHOD OF PAYMENT FOR WATER

490 7. (a) The Contractor shall pay the United States as provided in this Article for all  
491 Delivered Water at Rates, Charges, and the Tiered Pricing Component established in accordance with  
492 (i) the Secretary's then-existing ratesetting policy for M&I Water. Such ratesetting policies shall be  
493 amended, modified, or superseded only through a public notice and comment procedure;  
494 (ii) applicable Federal Reclamation law and associated rules and regulations, or policies; and  
495 (iii) other applicable provisions of this Contract. Payments shall be made by cash transaction,  
496 electronic funds transfer, or any other mechanism as may be agreed to in writing by the Contractor  
497 and the Contracting Officer. The Rates, Charges, and Tiered Pricing Component applicable to the  
498 Contractor upon execution of this Contract are set forth in Exhibit "B", as may be revised annually.

499                   (b)     The Contracting Officer shall notify the Contractor of the Rates, Charges, and  
500 Tiered Pricing Component as follows:

501                   (1)     Prior to July 1 of each Calendar Year, the Contracting Officer shall  
502 provide the Contractor an estimate of the Charges for Project Water that will be applied to the period  
503 October 1, of the current Calendar Year, through September 30, of the following Calendar Year, and  
504 the basis for such estimate. The Contractor shall be allowed not less than two months to review and  
505 comment on such estimates. On or before September 15 of each Calendar Year, the Contracting  
506 Officer shall notify the Contractor in writing of the Charges to be in effect during the period  
507 October 1 of the current Calendar Year, through September 30, of the following Calendar Year, and  
508 such notification shall revise Exhibit "B."

509                   (2)     Prior to October 1 of each Calendar Year, the Contracting Officer shall  
510 make available to the Contractor an estimate of the Rates and Tiered Pricing Component for Project  
511 Water for the following Year and the computations and cost allocations upon which those Rates are  
512 based. The Contractor shall be allowed not less than two months to review and comment on such  
513 computations and cost allocations. By December 31 of each Calendar Year, the Contracting Officer  
514 shall provide the Contractor with the final Rates and Tiered Pricing Component to be in effect for the  
515 upcoming Year, and such notification shall revise Exhibit "B."

516                   (c)     At the time the Contractor submits the initial schedule for the delivery of  
517 Project Water for each Year pursuant to subdivision (b) of Article 4 of this Contract, the Contractor  
518 shall make an advance payment to the United States equal to the total amount payable pursuant to the  
519 applicable Rate(s) set under subdivision (a) of this Article, for the Project Water scheduled to be

520 delivered pursuant to this Contract during the first two calendar months of the Year. Before the end  
521 of the first month and before the end of each calendar month thereafter, the Contractor shall make an  
522 advance payment to the United States, at the Rate(s) set under subdivision (a) of this Article, for the  
523 Water Scheduled to be delivered pursuant to this Contract during the second month immediately  
524 following. Adjustments between advance payments for Water Scheduled and payments at Rates due  
525 for Water Delivered shall be made before the end of the following month; Provided, That any revised  
526 schedule submitted by the Contractor pursuant to Article 4 of this Contract which increases the  
527 amount of Water Delivered pursuant to this Contract during any month shall be accompanied with  
528 appropriate advance payment, at the Rates then in effect, to assure that Project Water is not delivered  
529 to the Contractor in advance of such payment. In any month in which the quantity of Water Delivered  
530 to the Contractor pursuant to this Contract equals the quantity of Water Scheduled and paid for by the  
531 Contractor, no additional Project Water shall be delivered to the Contractor unless and until an  
532 advance payment at the Rates then in effect for such additional Project Water is made. Final  
533 adjustment between the advance payments for the Water Scheduled and payments for the quantities  
534 of Water Delivered during each Year pursuant to this Contract shall be made as soon as practicable  
535 but no later than April 30th of the following Year, or 60 days after the delivery of Project Water  
536 carried over under subdivision (g) of Article 3 of this Contract if such water is not delivered by the  
537 last day of February.

538 (d) The Contractor shall also make a payment in addition to the Rate(s) in  
539 subdivision (c) of this Article to the United States for Water Delivered, at the Charges and the

540 appropriate Tiered Pricing Component then in effect, before the end of the month following the  
541 month of delivery. The payments shall be consistent with the quantities of M&I Water Delivered as  
542 shown in the water delivery report for the subject month prepared by the Operating Non-Federal  
543 Entity or, if there is no Operating Non-Federal Entity, by the Contracting Officer. Such water  
544 delivery report shall be the basis for payment of Charges and Tiered Pricing Component by the  
545 Contractor, and shall be provided to the Contractor by the Operating Non-Federal Entity or the  
546 Contracting Officer (as applicable) within five days after the end of the month of delivery. The water  
547 delivery report shall be deemed a bill for the payment of Charges and the applicable Tiered Pricing  
548 Component for Water Delivered. Adjustment for overpayment or underpayment of Charges shall be  
549 made through the adjustment of payments due to the United States for Charges for the next month.  
550 Any amount to be paid for past due payment of Charges and the Tiered Pricing Component shall be  
551 computed pursuant to Article 20 of this Contract.

552 (e) The Contractor shall pay for any Water Delivered under subdivision (a), (f), or  
553 (g) of Article 3 of this Contract as determined by the Contracting Officer pursuant to applicable  
554 statutes, associated regulations, any applicable provisions of guidelines or ratesetting policies;  
555 Provided, That the Rate for Water Delivered under subdivision (f) of Article 3 of this Contract shall  
556 be no more than the otherwise applicable Rate for M&I Water under subdivision (a) of this Article.

557 (f) Payments to be made by the Contractor to the United States under this  
558 Contract may be paid from any revenues available to the Contractor.

559 (g) All revenues received by the United States from the Contractor relating to the  
560 delivery of Project Water or the delivery of non-Project water through Project facilities shall be

561 allocated and applied in accordance with Federal Reclamation law and the associated rules or  
562 regulations, and the then-current Project ratesetting policies for M&I Water.

563 (h) The Contracting Officer shall keep its accounts pertaining to the administration  
564 of the financial terms and conditions of its long-term contracts, in accordance with applicable Federal  
565 standards, so as to reflect the application of Project costs and revenues. The Contracting Officer  
566 shall, each Year upon request of the Contractor, provide to the Contractor a detailed accounting of all  
567 Project and Contractor expense allocations, the disposition of all Project and Contractor revenues,  
568 and a summary of all water delivery information. The Contracting Officer and the Contractor shall  
569 enter into good faith negotiations to resolve any discrepancies or disputes relating to accountings,  
570 reports, or information.

571 (i) The parties acknowledge and agree that the efficient administration of this  
572 Contract is their mutual goal. Recognizing that experience has demonstrated that mechanisms,  
573 policies, and procedures used for establishing Rates, Charges, and Tiered Pricing Components, and/or  
574 for making and allocating payments, other than those set forth in this Article may be in the mutual  
575 best interest of the parties, it is expressly agreed that the parties may enter into agreements to modify  
576 the mechanisms, policies, and procedures for any of those purposes while this Contract is in effect  
577 without amending this Contract.

578 (j) (1) Beginning at such time as the total of the deliveries of Class 1 Water  
579 and Class 2 Water in a Year exceed 80 percent of the Contract Total, then before the end of the month  
580 following the month of delivery the Contractor shall make an additional payment to the United States  
581 equal to the applicable Tiered Pricing Component. The Tiered Pricing Component for the total of the

582 deliveries of Class 1 Water and Class 2 Water in excess of 80 percent of the Contract Total, but less  
583 than or equal to 90 percent of the Contract Total, shall equal one-half of the difference between the  
584 Rate established under subdivision (a) of this Article and the M&I Full Cost Water Rate. The Tiered  
585 Pricing Component for the total of the deliveries of Class 1 Water and Class 2 Water which exceeds  
586 90 percent of the Contract total shall equal the difference between (i) the Rate established under  
587 subdivision (a) of this Article and (ii) the M&I Full Cost Water Rate.

588 " (2) Omitted.

589 (3) For purposes of determining the applicability of the Tiered Pricing  
590 Component pursuant to this Article, Water Delivered shall include Project Water that the Contractor  
591 transfers to others but shall not include Project Water transferred and delivered to the Contractor.

592 (k) For the term of this Contract, Rates under the respective ratesetting policies  
593 will be established to recover only reimbursable O&M (including any deficits) and capital costs of the  
594 Project, as those terms are used in the then-current Project ratesetting policies, and interest, where  
595 appropriate, except in instances where a minimum Rate is applicable in accordance with the relevant  
596 Project ratesetting policy. Changes of significance in practices which implement the Contracting  
597 Officer's ratesetting policies will not be implemented until the Contracting Officer has provided the  
598 Contractor an opportunity to discuss the nature, need, and impact of the proposed change.

599 (l) Except as provided in subsections 3405(a)(1)(B) and 3405(f) of the CVPIA,  
600 the Rates for Project Water transferred by the Contractor shall be the Contractor's Rates adjusted  
601 upward or downward to reflect the changed costs, if any, incurred by the Contracting Officer in the

602 delivery of the transferred Project Water to the transferee's point of delivery in accordance with the  
603 then-applicable Project ratesetting policy.

604 (m) Omitted.

605 (n) The Contractor asserts that it is not legally obligated to pay any Project deficits  
606 claimed by the United States to have accrued as of the date of this Contract or deficit-related interest  
607 charges thereon. By entering into this Contract, the Contractor does not waive any legal rights or  
608 remedies that it may have with respect to such disputed issues. Notwithstanding the execution of this  
609 Contract and payments made hereunder, the Contractor may challenge in the appropriate  
610 administrative or judicial forums: (1) the existence, computation, or imposition of any deficit charges  
611 accruing during the term of the Existing Contract; (2) interest accruing on any such deficits; (3) the  
612 inclusion of any such deficit charges or interest in the Rates; (4) the application by the United States  
613 of payments made by the Contractor under its Existing Contract; and (5) the application of such  
614 payments in the Rates. The Contracting Officer agrees that the Contractor shall be entitled to the  
615 benefit of any administrative or judicial ruling in favor of any Project M&I contractor on any of these  
616 issues and credits for payments heretofore made; Provided, That the basis for such ruling is applicable  
617 to the Contractor.

618 8. Omitted.

619 SALES, TRANSFERS, OR EXCHANGES OF WATER

620 9. (a) The right to receive Project Water provided for in this Contract may be sold,  
621 transferred, or exchanged to others for reasonable and beneficial uses within the State of California if  
622 such sale, transfer, or exchange is authorized by applicable Federal and State laws, and applicable

623 guidelines or regulations then in effect. No sale, transfer, or exchange of Project Water under this  
624 Contract may take place without the prior written approval of the Contracting Officer, except as  
625 provided for in subdivision (b) of this Article, and no such sales, transfers, or exchanges shall be  
626 approved absent all appropriate environmental documentation including, but not limited to,  
627 documents prepared pursuant to the NEPA and ESA. Such environmental documentation should  
628 include, as appropriate, an analysis of groundwater impacts and economic and social effects,  
629 including environmental justice, of the proposed water transfers on both the transferor and transferee.

630           (b)     In order to facilitate efficient water management by means of water transfers of  
631 the type historically carried out among Project Contractors located within the same geographical area  
632 and to allow the Contractor to participate in an accelerated water transfer program during the term of  
633 this Contract, the Contracting Officer shall prepare, as appropriate, all necessary environmental  
634 documentation including, but not limited to, documents prepared pursuant to NEPA and ESA,  
635 analyzing annual transfers within such geographical areas, and the Contracting Officer shall  
636 determine whether such transfers comply with applicable law. Following the completion of the  
637 environmental documentation, such transfers addressed in such documentation shall be conducted  
638 with advance notice to the Contracting Officer, but shall not require prior written approval by the  
639 Contracting Officer. Such environmental documentation and the Contracting Officer's compliance  
640 determination shall be reviewed every five years and updated, as necessary, prior to the expiration of  
641 the then-existing five-year period. All subsequent environmental documentation shall include an  
642 alternative to evaluate not less than the quantity of Project Water historically transferred within the  
643 same geographical area.

644 (c) For a water transfer to qualify under subdivision (b) of this Article, such water  
645 transfer must: (i) be for irrigation purposes for lands irrigated within the previous three years, for  
646 M&I use, groundwater recharge, water banking, or fish and wildlife resources; not lead to land  
647 conversion; and be delivered to established cropland, wildlife refuges, groundwater basins or M&I  
648 use; (ii) occur within a single Year; (iii) occur between a willing seller and a willing buyer; (iv)  
649 convey water through existing facilities with no new construction or modifications to facilities and be  
650 between existing Project Contractors and/or the Contractor and the United States, Department of the  
651 Interior; and (v) comply with all applicable Federal, State, and local or tribal laws and requirements  
652 imposed for protection of the environment and Indian Trust Assets, as defined under Federal law.

653 APPLICATION OF PAYMENTS AND ADJUSTMENTS

654 10. (a) The amount of any overpayment by the Contractor of the Contractor's O&M,  
655 capital, and deficit (if any) obligations for the Year shall be applied first to any current liabilities of  
656 the Contractor arising out of this Contract then due and payable. Overpayments of more than \$1,000  
657 shall be refunded at the Contractor's request. In lieu of a refund, any amount of such overpayment, at  
658 the option of the Contractor, may be credited against amounts to become due to the United States by  
659 the Contractor. With respect to overpayment, such refund or adjustment shall constitute the sole  
660 remedy of the Contractor or anyone having or claiming to have the right to the use of any of the  
661 Project Water supply provided for herein. All credits and refunds of overpayments shall be made  
662 within 30 days of the Contracting Officer obtaining direction as to how to credit or refund such  
663 overpayment in response to the notice to the Contractor that it has finalized the accounts for the Year  
664 in which the overpayment was made.

665 (b) All advances for miscellaneous costs incurred for work requested by the  
666 Contractor pursuant to Article 25 of this Contract shall be adjusted to reflect the actual costs when the  
667 work has been completed. If the advances exceed the actual costs incurred, the difference will be  
668 refunded to the Contractor. If the actual costs exceed the Contractor's advances, the Contractor will  
669 be billed for the additional costs pursuant to Article 25.

670 TEMPORARY REDUCTIONS--RETURN FLOWS

671 11. (a) Subject to: (i) the authorized purposes and priorities of the Project and the  
672 requirements of Federal law and (ii) the obligations of the United States under existing contracts, or  
673 renewals thereof, providing for water deliveries from the Project, the Contracting Officer shall make  
674 all reasonable efforts to optimize Project Water deliveries to the Contractor as provided in this  
675 Contract.

676 (b) The Contracting Officer or Operating Non-Federal Entity may temporarily  
677 discontinue or reduce the quantity of Water Delivered to the Contractor as herein provided for the  
678 purposes of investigation, inspection, maintenance, repair, or replacement of any of the Project  
679 facilities or any part thereof necessary for the delivery of Project Water to the Contractor, but so far as  
680 feasible the Contracting Officer or Operating Non-Federal Entity will give the Contractor due notice  
681 in advance of such temporary discontinuance or reduction, except in case of emergency, in which case  
682 no notice need be given; Provided, That the United States shall use its best efforts to avoid any  
683 discontinuance or reduction in such service. Upon resumption of service after such reduction or  
684 discontinuance, and if requested by the Contractor, the United States will, if possible, deliver the

685 quantity of Project Water which would have been delivered hereunder in the absence of such  
686 discontinuance or reduction.

687 (c) The United States reserves the right to all seepage and return flow water  
688 derived from Water Delivered to the Contractor hereunder which escapes or is discharged beyond the  
689 Contractor's Service Area; Provided, That this shall not be construed as claiming for the United States  
690 any right to seepage or return flow being put to reasonable and beneficial use pursuant to this  
691 Contract within the Contractor's Service Area by the Contractor or those claiming by, through, or  
692 under the Contractor.

693 CONSTRAINTS ON THE AVAILABILITY OF WATER

694 12. (a) In its operation of the Project, the Contracting Officer will use all reasonable  
695 means to guard against a Condition of Shortage in the quantity of water to be made available to the  
696 Contractor pursuant to this Contract. In the event the Contracting Officer determines that a Condition  
697 of Shortage appears probable, the Contracting Officer will notify the Contractor of said determination  
698 as soon as practicable.

699 (b) If there is a Condition of Shortage because of errors in physical operations of  
700 the Project, drought, other physical causes beyond the control of the Contracting Officer or actions  
701 taken by the Contracting Officer to meet legal obligations then, except as provided in subdivision (a)  
702 of Article 18 of this Contract, no liability shall accrue against the United States or any of its officers,  
703 agents, or employees for any damage, direct or indirect, arising therefrom.

704 (c) The United States shall not execute contracts which together with this  
705 Contract, shall in the aggregate provide for furnishing during the life of this Contract or any renewals

706 hereof Class 1 Water in excess of 800,000 acre-feet per Year or Class 2 Water in excess of  
707 1,401,475 acre-feet per Year; Provided, That, subject to subdivision (l) of Article 3 of this Contract,  
708 the limitation placed on Class 2 Water contracts shall not prohibit the United States from entering  
709 into temporary contracts of one year or less in duration for delivery of Project Water to other entities  
710 if such water is not necessary to meet the schedules as may be submitted by all Friant Division long-  
711 term water service contractors entitled to receive Class 1 Water and/or Class 2 Water under their  
712 water service contracts. Nothing in this subdivision shall limit the Contracting Officer's ability to  
713 take actions that result in the availability of new water supplies to be used for Project purposes and  
714 allocating such new supplies; Provided, That the Contracting Officer shall not take such actions until  
715 after consultation with the Friant Division Project Contractors.

716 (d) The Contracting Officer shall not deliver any Class 2 Water pursuant to this or  
717 any other contract for water service heretofore or hereafter entered into any Year unless and until the  
718 Contracting Officer determines that the cumulative total quantity of Class 1 Water specified in  
719 subdivision (c) of this Article will be available for delivery in said Year. If the Contracting Officer  
720 determines there is or will be a shortage in any Year in the quantity of Class 1 Water available for  
721 delivery, the Contracting Officer shall apportion the available Class 1 Water among all contractors  
722 entitled to receive such water that will be made available at Friant Dam in accordance with the  
723 following:

724 (1) A determination shall be made of the total quantity of Class 1 Water at  
725 Friant Dam which is available for meeting Class 1 Water contractual commitments, the amount so  
726 determined being herein referred to as the available supply.

727                                   (2)     The total available Class 1 supply shall be divided by the Class 1 Water  
728 contractual commitments, the quotient thus obtained being herein referred to as the Class 1  
729 apportionment coefficient.

730                                   (3)     The total quantity of Class 1 Water under Article 3 of this Contract  
731 shall be multiplied by the Class 1 apportionment coefficient and the result shall be the quantity of  
732 Class 1 Water required to be delivered by the Contracting Officer to the Contractor for the respective  
733 Year, but in no event shall such amount exceed the total quantity of Class 1 Water specified in  
734 subdivision (a) of Article 3 of this Contract.

735                                   (e)     If the Contracting Officer determines there is less than the quantity of Class 2  
736 Water which the Contractor otherwise would be entitled to receive pursuant to Article 3 of this  
737 Contract, the quantity of Class 2 Water which shall be furnished to the Contractor by the Contracting  
738 Officer will be determined in the manner set forth in paragraphs (1), (2), and (3), of subdivision (d) of  
739 this Article substituting the term "Class 2" for the term "Class 1."

740                                   (f)     In the event that in any Year there is made available to the Contractor, by  
741 reason of any shortage or apportionment as provided in subdivisions (a), (d), or (e) of this Article, or  
742 any discontinuance or reduction of service as set forth in subdivision (b) of Article 11 of this  
743 Contract, less than the quantity of water which the Contractor otherwise would be entitled to receive  
744 hereunder, there shall be made an adjustment on account of the amounts already paid to the  
745 Contracting Officer by the Contractor for Class 1 Water and Class 2 Water for said Year in  
746 accordance with Article 10 of this Contract.

747                                   13.     Omitted.

748  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769

RULES AND REGULATIONS

14. (a) The parties agree that the delivery of Project Water or use of Federal facilities pursuant to this Contract is subject to Federal Reclamation law, as amended and supplemented, and the rules and regulations promulgated by the Secretary of the Interior under Federal Reclamation law.

(b) The terms of this Contract are subject to any enforceable order, judgment and/or settlement in NRDC v. Patterson, No. CIVS 88-1658-LKK-EM and shall be timely modified as necessary to effectuate or facilitate any final order, judgment, or settlement in said litigation.

(c) Omitted.

WATER AND AIR POLLUTION CONTROL

15. The Contractor, in carrying out this Contract, shall comply with all applicable water and air pollution laws and regulations of the United States and the State of California, and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities.

QUALITY OF WATER

16. (a) Project facilities used to deliver Project Water to the Contractor pursuant to this Contract shall be operated and maintained to enable the United States to deliver Project Water to the Contractor in accordance with the water quality standards specified in subsection 2(b) of the Act of August 26, 1937 (50 Stat. 865), as added by Section 101 of the Act of October 27, 1986 (100 Stat. 3050) or other existing Federal laws. The United States is under no obligation to construct or furnish water treatment facilities to maintain or to improve the quality of Water Delivered to the Contractor pursuant to this Contract. The United States does not warrant the quality of Water Delivered to the Contractor pursuant to this Contract.

770 (b) The O&M of Project facilities shall be performed in such manner as is  
771 practicable to maintain the quality of raw water made available through such facilities at the highest  
772 level reasonably attainable as determined by the Contracting Officer. The Contractor shall be  
773 responsible for compliance with all State and Federal water quality standards applicable to surface  
774 and subsurface agricultural drainage discharges generated through the use of Federal or Contractor  
775 facilities or Project Water provided by the Contractor within the Contractor's Service Area.

776 WATER ACQUIRED BY THE CONTRACTOR  
777 OTHER THAN FROM THE UNITED STATES

778 17. (a) Omitted.

779 (b) Water or water rights now owned or hereafter acquired by the Contractor, other  
780 than from the United States, may be stored, conveyed, and/or diverted through Project facilities,  
781 subject to the completion of appropriate environmental documentation, with the approval of the  
782 Contracting Officer and the execution of any contract determined by the Contracting Officer to be  
783 necessary, consistent with the following provisions:

784 (1) The Contractor may introduce non-Project water into Project facilities  
785 and deliver said water within the Contractor's Service Area subject to payment to the United States  
786 and/or to any applicable Operating Non-Federal Entity of an appropriate rate as determined by the  
787 applicable Project ratemaking policy, the RRA, and the Project use power policy, if such Project use  
788 power policy is applicable, each as amended, modified or superseded from time to time.

789 (2) Delivery of such non-Project water in and through Project facilities  
790 shall only be allowed to the extent such deliveries do not: (i) interfere with other Project purposes as

791 determined by the Contracting Officer; (ii) reduce the quantity or quality of water available to other  
792 Project Contractors; (iii) interfere with the delivery of contractual water entitlements to any other  
793 Project Contractors; or (iv) interfere with the physical maintenance of the Project facilities.

794 (3) Neither the United States nor the Operating Non-Federal Entity shall be  
795 responsible for control, care, or distribution of the non-Project water before it is introduced into or  
796 after it is delivered from the Project facilities. The Contractor hereby releases and agrees to defend  
797 and indemnify the United States and the Operating Non-Federal Entity, and their respective officers,  
798 agents, and employees, from any claim for damage to persons or property, direct or indirect, resulting  
799 from the acts of the Contractor its officers', employees', agents' or assigns', act(s) in (i) extracting or  
800 diverting non-Project water from any source, or (ii) diverting such non-Project water into Project  
801 facilities.

802 (4) Diversion of such non-Project water into Project facilities shall be  
803 consistent with all applicable laws, and if involving groundwater, consistent with any groundwater  
804 management plan for the area from which it was extracted.

805 (5) After Project purposes are met, as determined by the Contracting  
806 Officer, the United States and the Contractor shall share priority to utilize the remaining capacity of  
807 the facilities declared to be available by the Contracting Officer for conveyance and transportation of  
808 non-Project water prior to any such remaining capacity being made available to non-Project  
809 contractors.

810

OPINIONS AND DETERMINATIONS

811

18. (a) Where the terms of this Contract provide for actions to be based upon the

812

opinion or determination of either party to this Contract, said terms shall not be construed as

813

permitting such action to be predicated upon arbitrary, capricious, or unreasonable opinions or

814

determinations. Both parties, notwithstanding any other provisions of this Contract, expressly reserve

815

the right to seek relief from and appropriate adjustment for any such arbitrary, capricious, or

816

unreasonable opinion or determination. Each opinion or determination by either party shall be

817

provided in a timely manner. Nothing in subdivision (a) of Article 18 of this Contract is intended to

818

or shall affect or alter the standard of judicial review applicable under Federal law to any opinion or

819

determination implementing a specific provision of Federal law embodied in statute or regulation.

820

(b) The Contracting Officer shall have the right to make determinations necessary

821

to administer this Contract that are consistent with the expressed and implied provisions of this

822

Contract, the laws of the United States and of the State of California, and the rules and regulations

823

promulgated by the Secretary of the Interior. Such determinations shall be made in consultation with

824

the Contractor to the extent reasonably practicable.

825

COORDINATION AND COOPERATION

826

19. (a) In order to further their mutual goals and objectives, the Contracting Officer

827

and the Contractor shall communicate, coordinate, and cooperate with each other, and with other

828

affected Project Contractors, in order to improve the operation and management of the Project. The

829

communication, coordination, and cooperation regarding operations and management shall include,

830

but not be limited to, any action which will or may materially affect the quantity or quality of Project

831 Water supply, the allocation of Project Water supply, and Project financial matters including, but not  
832 limited to, budget issues. The communication, coordination, and cooperation provided for hereunder  
833 shall extend to all provisions of this Contract. Each party shall retain exclusive decision making  
834 authority for all actions, opinion, and determinations to be made by the respective party.

835 (b) Within 120 days following the effective date of this Contract, the Contractor,  
836 other affected Project Contractors, and the Contracting Officer shall arrange to meet with interested  
837 Project Contractors to develop a mutually agreeable, written Project-wide process, which may be  
838 amended as necessary separate and apart from this Contract. The goal of this process shall be to  
839 provide, to the extent practicable, the means of mutual communication and interaction regarding  
840 significant decisions concerning Project operation and management on a real-time basis.

841 (c) It is the intent of the Secretary to improve water supply reliability. To carry out  
842 this intent:

843 (1) The Contracting Officer will, at the request of the Contractor, assist in  
844 the development of integrated resource management plans for the Contractor. Further, the  
845 Contracting Officer will, as appropriate, seek authorizations for implementation of partnerships to  
846 improve water supply, water quality, and reliability.

847 (2) The Secretary will, as appropriate, pursue program and project  
848 implementation and authorization in coordination with Project Contractors to improve the water  
849 supply, water quality, and reliability of the Project for all Project purposes.

850 (3) The Secretary will coordinate with Project Contractors and the State of  
851 California to seek improved water resource management.

852 (4) The Secretary will coordinate actions of agencies within the  
853 Department of the Interior that may impact the availability of water for Project purposes.

854 (5) The Contracting Officer shall periodically, but not less than annually,  
855 hold division level meetings to discuss Project operations, division level water management activities,  
856 and other issues as appropriate.

857 (d) Without limiting the contractual obligations of the Contracting Officer under  
858 the other Articles of this Contract, nothing in this Article shall be construed to limit or constrain the  
859 Contracting Officer's ability to communicate, coordinate, and cooperate with the Contractor or other  
860 interested stakeholders or to make decisions in a timely fashion as needed to protect health, safety, or  
861 the physical integrity of structures or facilities.

862 CHARGES FOR DELINQUENT PAYMENTS

863 20. (a) The Contractor shall be subject to interest, administrative and penalty charges  
864 on delinquent installments or payments. When a payment is not received by the due date, the  
865 Contractor shall pay an interest charge for each day the payment is delinquent beyond the due date.  
866 When a payment becomes sixty (60) days delinquent, the Contractor shall pay an administrative  
867 charge to cover additional costs of billing and processing the delinquent payment. When a payment is  
868 delinquent ninety (90) days or more, the Contractor shall pay an additional penalty charge of six (6%)  
869 percent per year for each day the payment is delinquent beyond the due date. Further, the Contractor  
870 shall pay any fees incurred for debt collection services associated with a delinquent payment.

871 (b) The interest charge rate shall be the greater of the rate prescribed quarterly in  
872 the Federal Register by the Department of the Treasury for application to overdue payments, or the  
873 interest rate of one-half of one (0.5%) percent per month prescribed by Section 6 of the Reclamation  
874 Project Act of 1939 (Public Law 76-260). The interest charge rate shall be determined as of the due  
875 date and remain fixed for the duration of the delinquent period.

876 (c) When a partial payment on a delinquent account is received, the amount  
877 received shall be applied, first to the penalty, second to the administrative charges, third to the  
878 accrued interest, and finally to the overdue payment.

879

EQUAL OPPORTUNITY

880

21. During the performance of this Contract, the Contractor agrees as follows:

881

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination, rates of payment or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

890

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without discrimination because of race, color, religion, sex, or national origin.

893

(c) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Contracting Officer, advising the said labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

899

(d) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

902

(e) The Contractor will furnish all information and reports required by said amended Executive Order and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Contracting Officer and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

907

(f) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in said amended Executive Order, and such other sanctions may be imposed and remedies invoked as provided in said Executive Order, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

914 (g) The Contractor will include the provisions of paragraphs (a) through (g) in  
915 every subcontract or purchase order unless exempted by the rules, regulations, or orders of the  
916 Secretary of Labor issued pursuant to Section 204 of said amended Executive Order, so that such  
917 provisions will be binding upon each subcontractor or vendor. The Contractor will take such action  
918 with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a  
919 means of enforcing such provisions, including sanctions for noncompliance: Provided, however,  
920 That in the event the Contractor becomes involved in, or is threatened with, litigation with a  
921 subcontractor or vendor as a result of such direction, the Contractor may request the United States to  
922 enter into such litigation to protect the interests of the United States.

923 GENERAL OBLIGATION--BENEFITS CONDITIONED UPON PAYMENT

924 22. (a) The obligation of the Contractor to pay the United States as provided in this  
925 Contract is a general obligation of the Contractor notwithstanding the manner in which the obligation  
926 may be distributed among the Contractor's water users and notwithstanding the default of individual  
927 water users in their obligations to the Contractor.

928 (b) The payment of charges becoming due hereunder is a condition precedent to  
929 receiving benefits under this Contract. The United States shall not make water available to the  
930 Contractor through Project facilities during any period in which the Contractor may be in arrears in  
931 the advance payment of water rates due the United States. The Contractor shall not furnish water  
932 made available pursuant to this Contract for lands or parties which are in arrears in the advance  
933 payment of water rates levied or established by the Contractor.

934 (c) With respect to subdivision (b) of this Article, the Contractor shall have no  
935 obligation to require advance payment for water rates which it levies.

936 COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

937 23. (a) The Contractor shall comply with Title VI of the Civil Rights Act of 1964  
938 (42 U.S.C. 2000d), Section 504 of the Rehabilitation Act of 1975 (P.L. 93-112, as amended), the  
939 Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.) and any other applicable civil rights  
940 laws, as well as with their respective implementing regulations and guidelines imposed by the  
941 U.S. Department of the Interior and/or Bureau of Reclamation.

942 (b) These statutes require that no person in the United States shall, on the grounds  
943 of race, color, national origin, handicap, or age, be excluded from participation in, be denied the  
944 benefits of, or be otherwise subjected to discrimination under any program or activity receiving  
945 financial assistance from the Bureau of Reclamation. By executing this Contract, the Contractor

946 agrees to immediately take any measures necessary to implement this obligation, including permitting  
947 officials of the United States to inspect premises, programs, and documents.

948 (c) The Contractor makes this agreement in consideration of and for the purpose of  
949 obtaining any and all Federal grants, loans, contracts, property discounts, or other Federal financial  
950 assistance extended after the date hereof to the Contractor by the Bureau of Reclamation, including  
951 installment payments after such date on account of arrangements for Federal financial assistance  
952 which were approved before such date. The Contractor recognizes and agrees that such Federal  
953 assistance will be extended in reliance on the representations and agreements made in this Article,  
954 and that the United States reserves the right to seek judicial enforcement thereof.

955 24. Omitted.

956 CONTRACTOR TO PAY CERTAIN MISCELLANEOUS COSTS

957 25. In addition to all other payments to be made by the Contractor pursuant to this  
958 Contract, the Contractor shall pay to the United States, within 60 days after receipt of a bill and  
959 detailed statement submitted by the Contracting Officer to the Contractor for such specific items of  
960 direct cost incurred by the United States for work requested by the Contractor associated with this  
961 Contract plus indirect costs in accordance with applicable Bureau of Reclamation policies and  
962 procedures. All such amounts referred to in this Article shall not exceed the amount agreed to in  
963 writing in advance by the Contractor. This Article shall not apply to costs for routine contract  
964 administration.

965 WATER CONSERVATION

966 26. (a) Prior to the delivery of water provided from or conveyed through Federally  
967 constructed or Federally financed facilities pursuant to this Contract, the Contractor shall be  
968 implementing an effective water conservation and efficiency program based on the Contractor's water  
969 conservation plan that has been determined by the Contracting Officer to meet the conservation and

970 efficiency criteria for evaluating water conservation plans established under Federal law. The water  
971 conservation and efficiency program shall contain definite water conservation objectives, appropriate  
972 economically feasible water conservation measures, and time schedules for meeting those objectives.  
973 Continued Project Water delivery pursuant to this Contract shall be contingent upon the Contractor's  
974 continued implementation of such water conservation program. In the event the Contractor's water  
975 conservation plan or any revised water conservation plan completed pursuant to subdivision (d) of  
976 Article 26 of this Contract have not yet been determined by the Contracting Officer to meet such  
977 criteria, due to circumstances which the Contracting Officer determines are beyond the control of the  
978 Contractor, water deliveries shall be made under this Contract so long as the Contractor diligently  
979 works with the Contracting Officer to obtain such determination at the earliest practicable date, and  
980 thereafter the Contractor immediately begins implementing its water conservation and efficiency  
981 program in accordance with the time schedules therein.

982 (b) Should the amount of M&I Water delivered pursuant to subdivision (a) of  
983 Article 3 of this Contract equal or exceed 2,000 acre-feet per Year, the Contractor shall implement the  
984 Best Management Practices identified by the time frames issued by the California Urban Water  
985 Conservation Council for such M&I Water unless any such practice is determined by the Contracting  
986 Officer to be inappropriate for the Contractor.

987 (c) The Contractor shall submit to the Contracting Officer a report on the status of  
988 its implementation of the water conservation plan on the reporting dates specified in the then-existing  
989 conservation and efficiency criteria established under Federal law.

990 (d) At five-year intervals, the Contractor shall revise its water conservation plan to  
991 reflect the then-current conservation and efficiency criteria for evaluating water conservation plans  
992 established under Federal law and submit such revised water management plan to the Contracting  
993 Officer for review and evaluation. The Contracting Officer will then determine if the water  
994 conservation plan meets Reclamation's then-current conservation and efficiency criteria for  
995 evaluating water conservation plans established under Federal law.

996 (e) If the Contractor is engaged in direct groundwater recharge, such activity shall  
997 be described in the Contractor's water conservation plan.

998 EXISTING OR ACQUIRED WATER OR WATER RIGHTS

999 27. Except as specifically provided in Article 17 of this Contract, the provisions of this  
1000 Contract shall not be applicable to or affect non-Project water or water rights now owned or hereafter  
1001 acquired by the Contractor or any user of such water within the Contractor's Service Area. Any such  
1002 water shall not be considered Project Water under this Contract. In addition, this Contract shall not  
1003 be construed as limiting or curtailing any rights which the Contractor or any water user within the  
1004 Contractor's Service Area acquires or has available under any other contract pursuant to Federal  
1005 Reclamation law.

1006 OPERATION AND MAINTENANCE BY OPERATING NON-FEDERAL ENTITY

1007 28. (a) The O&M of a portion of the Project facilities which serve the Contractor, and  
1008 responsibility for funding a portion of the costs of such O&M, have been transferred to the Operating  
1009 Non-Federal Entity by separate agreement between the United States and the Operating Non-Federal

1010 Entity. That separate agreement shall not interfere with or affect the rights or obligations of the  
1011 Contractor or the United States hereunder.

1012 (b) The Contracting Officer has previously notified the Contractor in writing that  
1013 the O&M of a portion of the Project facilities which serve the Contractor has been transferred to the  
1014 Operating Non-Federal Entity, and therefore, the Contractor shall pay directly to the Operating  
1015 Non-Federal Entity, or to any successor approved by the Contracting Officer under the terms and  
1016 conditions of the separate agreement between the United States and the Operating Non-Federal Entity  
1017 described in subdivision (a) of this Article, all rates, charges or assessments of any kind, including  
1018 any assessment for reserve funds, which the Operating Non-Federal Entity or such successor  
1019 determines, sets or establishes for (i) the O&M of the portion of the Project facilities operated and  
1020 maintained by the Operating Non-Federal Entity or such successor, or (ii) the Friant Division's share  
1021 of the operation, maintenance and replacement costs for physical works and appurtenances associated  
1022 with the Tracy Pumping Plant, the Delta-Mendota Canal, the O'Neill Pumping/Generating Plant, the  
1023 federal share of the O'Neill Forebay, the Mendota Pool, and the federal share of San Luis Unit joint  
1024 use conveyance and conveyance pumping facilities. Such direct payments to the Operating  
1025 Non-Federal Entity or such successor shall not relieve the Contractor of its obligation to pay directly  
1026 to the United States the Contractor's share of the Project Rates, Charges, and Tiered Pricing  
1027 Component(s) except to the extent the Operating Non-Federal Entity collects payments on behalf of  
1028 the United States in accordance with the separate agreement identified in subdivision (a) of this  
1029 Article.

1030 (c) For so long as the O&M of any portion of the Project facilities serving the  
1031 Contractor is performed by the Operating Non-Federal Entity, or any successor thereto, the  
1032 Contracting Officer shall adjust those components of the Rates for Water Delivered under this  
1033 Contract representing the cost associated with the activity being performed by the Operating  
1034 Non-Federal Entity or its successor.

1035 (d) In the event the O&M of the Project facilities operated and maintained by the  
1036 Operating Non-Federal Entity is re-assumed by the United States during the term of this Contract, the  
1037 Contracting Officer shall so notify the Contractor, in writing, and present to the Contractor a revised  
1038 Exhibit "B" which shall include the portion of the Rates to be paid by the Contractor for Project  
1039 Water under this Contract representing the O&M costs of the portion of such Project facilities which  
1040 have been re-assumed. The Contractor shall, thereafter, in the absence of written notification from  
1041 the Contracting Officer to the contrary, pay the Rates, Charges, and Tiered Pricing Component(s)  
1042 specified in the revised Exhibit "B" directly to the United States in compliance with Article 7 of this  
1043 Contract.

1044 CONTINGENT ON APPROPRIATION OR ALLOTMENT OF FUNDS

1045 29. The expenditure or advance of any money or the performance of any obligation of the  
1046 United States under this Contract shall be contingent upon appropriation or allotment of funds.  
1047 Absence of appropriation or allotment of funds shall not relieve the Contractor from any obligations  
1048 under this Contract. No liability shall accrue to the United States in case funds are not appropriated  
1049 or allotted.

1050 BOOKS, RECORDS, AND REPORTS

1051 30. (a) The Contractor shall establish and maintain accounts and other books and  
1052 records pertaining to administration of the terms and conditions of this Contract, including: the  
1053 Contractor's financial transactions, water supply data, and Project land and right-of-way agreements;  
1054 water use data; and other matters that the Contracting Officer may require. Reports thereon shall be

1055 furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer  
1056 may require. Subject to applicable Federal laws and regulations, each party to this Contract shall  
1057 have the right during office hours to examine and make copies of the other party's books and records  
1058 relating to matters covered by this Contract.

1059 (b) Notwithstanding the provisions of subdivision (a) of this Article, no books,  
1060 records, or other information shall be requested from the Contractor by the Contracting Officer unless  
1061 such books, records, or information are reasonably related to the administration or performance of  
1062 this Contract. Any such request shall allow the Contractor a reasonable period of time within which  
1063 to provide the requested books, records, or information.

1064 (c) At such time as the Contractor provides information to the Contracting Officer  
1065 pursuant to subdivision (a) of this Article, a copy of such information shall be provided to the  
1066 Operating Non-Federal Entity.

1067 ASSIGNMENT LIMITED--SUCCESSORS AND ASSIGNS OBLIGATED

1068 31. (a) The provisions of this Contract shall apply to and bind the successors and  
1069 assigns of the parties hereto, but no assignment or transfer of this Contract or any right or interest  
1070 therein shall be valid until approved in writing by the Contracting Officer.

1071 (b) The assignment of any right or interest in this Contract by either party shall not  
1072 interfere with the rights or obligations of the other party to this Contract absent the written  
1073 concurrence of said other party.

1074 (c) The Contracting Officer shall not unreasonably condition or withhold approval  
1075 of any proposed assignment.

1076

SEVERABILITY

1077           32.    In the event that a person or entity who is neither (i) a party to a Project contract, nor  
1078   (ii) a person or entity that receives Project Water from a party to a Project contract, nor (iii) an  
1079   association or other form of organization whose primary function is to represent parties to Project  
1080   contracts, brings an action in a court of competent jurisdiction challenging the legality or  
1081   enforceability of a provision included in this Contract and said person, entity, association, or  
1082   organization obtains a final court decision holding that such provision is legally invalid or  
1083   unenforceable and the Contractor has not intervened in that lawsuit in support of the plaintiff(s), the  
1084   parties to this Contract shall use their best efforts to (i) within 30 days of the date of such final court  
1085   decision identify by mutual agreement the provisions in this Contract which must be revised and (ii)  
1086   within three months thereafter promptly agree on the appropriate revision(s). The time periods  
1087   specified above may be extended by mutual agreement of the parties. Pending the completion of the  
1088   actions designated above, to the extent it can do so without violating any applicable provisions of  
1089   law, the United States shall continue to make the quantities of Project Water specified in this Contract  
1090   available to the Contractor pursuant to the provisions of this Contract which were not found to be  
1091   legally invalid or unenforceable in the final court decision.

1092

RESOLUTION OF DISPUTES

1093           33.    Should any dispute arise concerning any provisions of this Contract, or the parties'  
1094   rights and obligations thereunder, the parties shall meet and confer in an attempt to resolve the  
1095   dispute. Prior to the Contractor commencing any legal action, or the Contracting Officer referring  
1096   any matter to Department of Justice, the party shall provide to the other party 30 days' written notice

1097 of the intent to take such action; Provided, That such notice shall not be required where a delay in  
1098 commencing an action would prejudice the interests of the party that intends to file suit. During the  
1099 30-day notice period, the Contractor and the Contracting Officer shall meet and confer in an attempt  
1100 to resolve the dispute. Except as specifically provided, nothing herein is intended to waive or abridge  
1101 any right or remedy that the Contractor or the United States may have.

1102 OFFICIALS NOT TO BENEFIT

1103 34. No Member of or Delegate to Congress, Resident Commissioner, or official of the  
1104 Contractor shall benefit from this Contract other than as a water user or landowner in the same  
1105 manner as other water users or landowners.

1106 CHANGES IN CONTRACTOR'S SERVICE AREA

1107 35. (a) While this Contract is in effect, no change may be made in the Contractor's  
1108 Service Area, by inclusion or exclusion of lands, dissolution, consolidation, merger, or otherwise,  
1109 except upon the Contracting Officer's written consent.

1110 (b) Within 30 days of receipt of a request for such a change, the Contracting  
1111 Officer will notify the Contractor of any additional information required by the Contracting Officer  
1112 for processing said request, and both parties will meet to establish a mutually agreeable schedule for  
1113 timely completion of the process. Such process will analyze whether the proposed change is likely to:  
1114 (i) result in the use of Project Water contrary to the terms of this Contract; (ii) impair the ability of  
1115 the Contractor to pay for Project Water furnished under this Contract or to pay for any Federally-  
1116 constructed facilities for which the Contractor is responsible; and (iii) have an impact on any Project  
1117 Water rights applications, permits, or licenses. In addition, the Contracting Officer shall comply with  
1118 the NEPA and the ESA. The Contractor will be responsible for all costs incurred by the Contracting  
1119 Officer in this process, and such costs will be paid in accordance with Article 25 of this Contract.

1120

FEDERAL LAWS

1121

36. By entering into this Contract, the Contractor does not waive its rights to contest the

1122

validity or application in connection with the performance of the terms and conditions of this

1123

Contract of any Federal law or regulation; Provided, That the Contractor agrees to comply with the

1124

terms and conditions of this Contract unless and until relief from application of such Federal law or

1125

regulation to the implementing provision of the Contract is granted by a court of competent

1126

jurisdiction.

1127

NOTICES

1128

37. Any notice, demand, or request authorized or required by this Contract shall be deemed to

1129

have been given, on behalf of the Contractor, when mailed, postage prepaid, or delivered to the Area

1130

Manager, South-Central California Area Office, 1243 "N" Street, Fresno, California 93721, and on

1131

behalf of the United States, when mailed, postage prepaid, or delivered to the City Council of the City

1132

of Fresno, 2600 Fresno Street, Room 3065, Fresno, California 93721-3624. The designation of the

1133

addressee or the address may be changed by notice given in the same manner as provided in this

1134

Article for other notices.

1135

CONFIRMATION OF CONTRACT

1136

38. The Contractor, after the execution of this Contract, shall furnish to the Contracting

1137

Officer evidence that pursuant to the laws of the State of California the Contractor is a legally

1138

constituted entity, and the Contract is lawful, valid, and binding on the Contractor. This Contract

1139

shall not be binding on the United States until such evidence has been provided to the Contracting

1140

Officer's satisfaction.

1141 IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day  
1142 and year first above written.

1143 THE UNITED STATES OF AMERICA

1144 By: \_\_\_\_\_  
1145 Regional Director, Mid-Pacific Region  
1146 Bureau of Reclamation

1147 (SEAL)

1148 CITY OF FRESNO

1149 By: \_\_\_\_\_  
1150 City Manager

1151 Attest:

1152 By: \_\_\_\_\_  
1153 City Clerk

1154 Approved as to form:

1155 \_\_\_\_\_  
1156 City Attorney

1157 (I:\LTRC\Final Draft LTRC's - Fresno, Tracy\08-07-2004 City of Fresno R. O. Final Draft  
1158 Contract.doc)

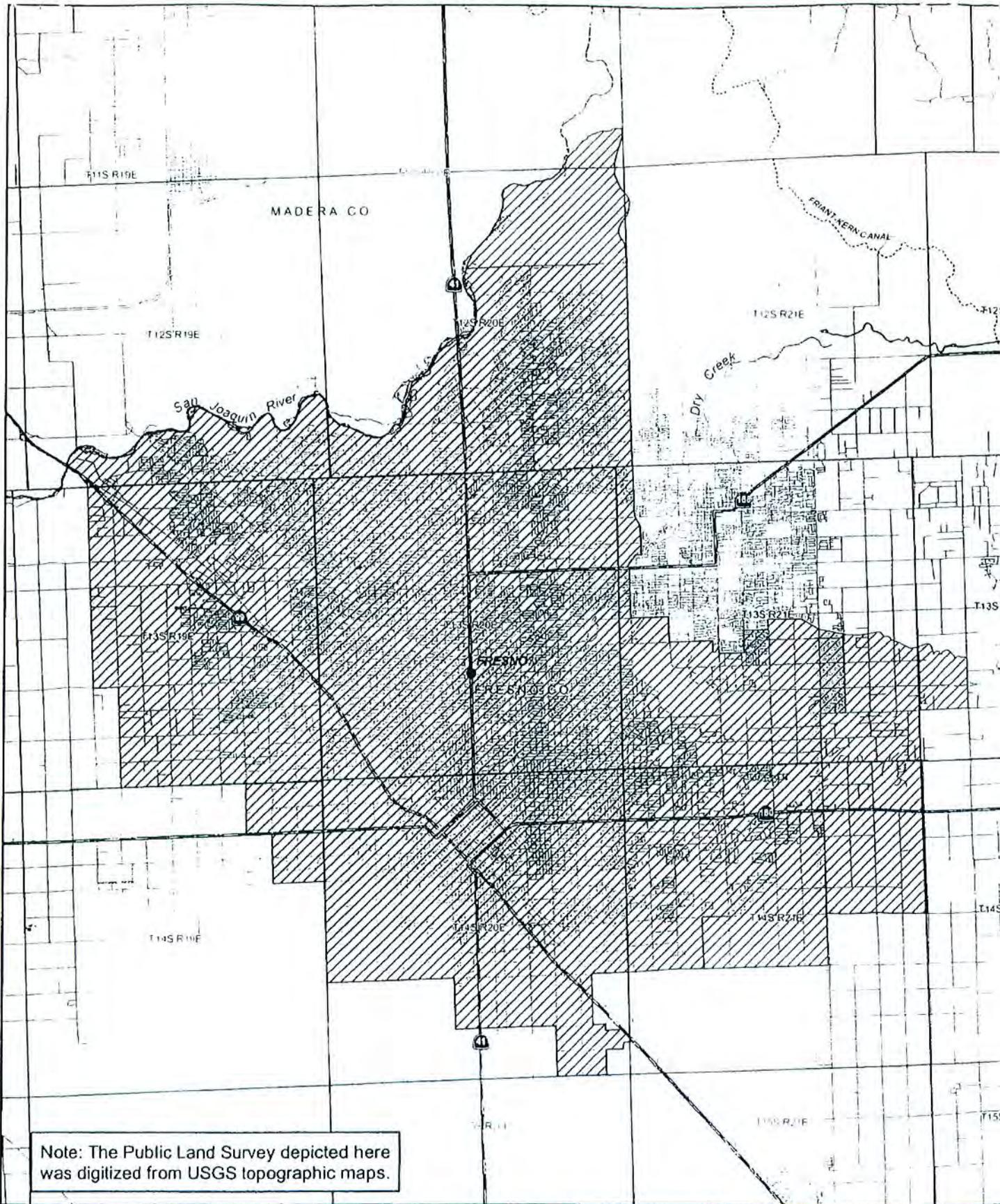
EXHIBIT B  
CITY OF FRESNO  
Water Rates and Charges

<b>CONTRACT NO. 14-06-200-8901-LTR1</b>	<b><u>2005 Rates Per Acre-Foot</u></b>
	M&I
O&M AND COST-OF-SERVICE RATES:	Water
Capital Rates:	\$20.04
O&M Rates:	
Water Marketing	\$3.89
Storage	\$6.67
Conveyance	*
Deficit Rates:	
Non-Interest Bearing	
Interest Bearing	\$53.53
CFO/PFR Adj Rate**	\$1.70
TOTAL COST-OF-SERVICE RATES (COS):	\$85.83
M&I FULL-COST RATE:	\$97.15
<b>Tiered Pricing Component &gt;80% &lt;=90% of Contract</b>	
<b>Total [Full Cost Rate - COS Rate /2]:</b>	\$5.66
<b>Tiered Pricing Component &gt;90% of Contract</b>	
<b>Total [Full Cost Rate - COS Rate]:</b>	\$11.32
SURCHARGES UNDER P.L. 102-575 TO RESTORATION FUND***	
Friant Surcharge [3406(c)(1)]	\$7.00
Restoration Payments [3407(d)(2)(A)]	\$15.87

\* Conveyance Operation and Maintenance costs were removed for ratesetting purposes and are to be billed directly by Friant Water Authority.

\*\* Chief Financial Officer (CFO) Adjustment and Provision for Replacement (PFR) Credit are being distributed over a 5-year period beginning in FY 2003 for the contractors that requested that the costs be deferred.

\*\*\* The surcharges are payments in addition to the water rates and were determined pursuant to Title XXXIV of Public Law 102-575. Restoration fund surcharges under P.L. 102-575 are on a fiscal year basis (10/1-9/30).



Note: The Public Land Survey depicted here was digitized from USGS topographic maps.

-  Proposed Contractor's Service Area (Sphere of Influence)
-  Current Contractor's Service Area

**City of Fresno**  
 Contract No. 14-06-200-8901-LTR1  
 EXHIBIT A



EXHIBIT C  
METERING PLAN

Completion Date	Item	Comments
03/05	Contract effective	
01/06	Implementation study	Select and obtain consultant study re implementation
01/06	Submit progress report to Bureau	
12/06	Confirmation of existing meters	Verify integrity and servicing of existing meters
01/07	Submit progress report to Bureau	
06/07	Secure installation contract	Begin implementation of consultant recommendations
12/07	Draft rate ordinance	Initial development of tiered rate structure
01/08	Submit progress report to Bureau	
01/08	Initiate retrofit	Begin installation of meters on existing dwellings
12/08	Meter installation progress	29% (30,000 of approximately 105,000 units installed)
01/09	Submit progress report to Bureau	
12/09	Meter installation progress	43% (45,000 units)
01/10	Submit progress report to Bureau	
03/10	Impose new rate ordinance (fees based on metered use)	New rate structure applicable to currently metered customers. Rates to be effective as new meter installations occur.
12/10	Meter installation progress	62% (65,000 units)
01/11	Submit progress report to Bureau	
12/11	Adopt new rate ordinance	81% (85,000 units)
01/12	Submit compliance report to Bureau	
12/12	Meter installation progress	100% (105,000 units)
01/13	Submit completion report	Retrofit complete.

Schedule subject to change due to unforeseen circumstances.

## **APPENDIX D2**

---

### **USBR Contract Amendment**



AGENDA ITEM NO. COUNCIL MEETING
APPROVED BY
DEPARTMENT DIRECTOR
CITY MANAGER

March 13, 2007

**FROM:** RENE A. RAMIREZ, Director  
Department of Public Utilities

**BY:** LON M. MARTIN, Assistant Director  
Department of Public Utilities

**SUBJECT:** RESOLUTION AUTHORIZING THE DEPARTMENT OF PUBLIC UTILITIES TO EXECUTE AN AMENDMENT TO THE LONG-TERM CENTRAL VALLEY PROJECT WATER SUPPLY CONTRACT AND FINDING SUCH ACTION EXEMPT FROM REVIEW UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT; AND AUTHORIZE THE CITY MANAGER AND DIRECTOR OF PUBLIC UTILITIES TO EXECUTE THE AGREEMENT ON BEHALF OF THE CITY

**KEY RESULT AREAS**

One Fresno  
Customer Service  
Resource Management

**RECOMMENDATIONS**

It is recommended that Council take action on the following items:

1. Adopt a resolution of the Council of Fresno, California, authorizing the Department of Public Utilities to execute an amendment to the long-term Central Valley Project Water Supply Contract and finding such action exempt from review under the California Environmental Quality Act.
2. Authorize the City Manager and the Director of Public Utilities to execute the contract amendment on behalf of the City.

**EXECUTIVE SUMMARY**

On July 19, 2005, the City of Fresno renewed its contract with the United States Bureau of Reclamation ("Bureau") for the Friant Division, Central Valley Project ("CVP") water supply for an additional 40-year term ("Renewal Contract"). Due to the expiration of the previous long-term contract, the City and the Bureau proceeded with the Renewal Contract, fully aware that there was current river restoration litigation (*Natural Resources Defense Council v. Patterson* (No. CIVS 88-1658-LKK-EM); referred to as the "Litigation"), that may require a future amendment. The proposed contract amendment simply incorporates the pre-existing commitment to comply with the resolution of the Litigation that was ongoing at the time the contract itself was signed in 2005. As a result of the settlement, the long-term average annual impact to the City is a reduction of less than 5% of its annual deliveries of CVP water.

## **KEY OBJECTIVE BALANCE**

Council action on this matter optimizes the three key objectives of customer satisfaction, employee satisfaction, and financial management by allowing the Department of Public Utilities to maintain a long-term CVP contract allowing for prudent natural resource management. Customer satisfaction is achieved by maintaining and retaining all available surface water supplies for current and future use. Employee satisfaction is derived from the ability to provide high quality reliable surface water for direct treatment and recharge operations.

## **BACKGROUND**

Article 14(b) of the Renewal Contract provides that the terms of the Renewal Contract "are subject to any enforceable order, judgment, and/or settlement in NRDC v. Patterson, No. CIVS 88-1658-LKK-EM and shall be timely modified as necessary to effectuate or facilitate any final order, judgment or settlement in said litigation." On October 23, 2006, Judge Karlton, United States District Court, approved a settlement to the Litigation ("Settlement"), which among other things, requires the City (and all other Friant contractors) to amend its Renewal Contract to conform to the settlement, as required in Article 14(b).

Prior to Settlement, the Litigation had been ongoing for several decades. The plaintiffs' primary focus with the Litigation was to develop a modified operational regime for the Friant Dam that would help restore some fishery and riparian resources along the San Joaquin River. Judge Karlton approved the Settlement on October 23, 2006.

As a result of the Settlement, the long-term average annual impact to the City is a reduction of less than 5% of its average annual deliveries of CVP water. The actual impact will vary from year-to-year based on weather and snow pack. In the critical driest of years, the City may receive little or no Friant water, but historically that has occurred even without the Settlement. In most normal and wet years, the City will not be impacted because of its Class 1 priority. In dry years, the City often received less than its full 60,000 acre-foot contract entitlement simply because there is insufficient water in the system to fulfill all the Friant Class 1 contract entitlements. The Settlement will fractionally further reduce deliveries in these dry years but it remains likely that the Friant contractors will receive their full contract entitlement (and access to excess water) in very wet years.

### **I. Fresno's Water Supply**

As a Class 1 CVP water contractor, the City is among the group of contractors that have the highest priority right to receive Friant water. Class 2 contractors do not receive any of their contracted amounts until Class 1 contractors receive their entire contract entitlement. Thus, the settlement does NOT modify or affect this priority system.

The City's long-term CVP contract entitles it to receive 60,000 acre-feet per year of water from the Bureau of Reclamation's Friant Reservoir. As noted above, the City indirectly obtains roughly 40% of its potable water supplies from this supply. The balance of the City's water supply is indirectly obtained through its water rights to the Kings River. Now, both these supplies are primarily used for local groundwater basin recharge. Although, with operation of the current surface water treatment facility and a second planned for Southeast Fresno, direct treatment of surface water is an increasingly important component to the delivery of potable water.

The actual amount of surface water the City obtains from its CVP contract and its Kings River water rights vary

based on local hydrology. In wet years the City receives the full amount of its entitlement. It receives less than its full entitlement in drier years. In extreme wet years, excess supplies are available for nominal additional cost. Because the City uses its surface water supplies conjunctively with the local groundwater basin, and the overall yield of the groundwater basin is on the order of several million acre feet, the year-to-year variability of surface water supplies has a negligible impact the long-term reliability of the City water supplies.

In other words, the important attribute of the City's water management practice is its ability to maximize its local recharge of its available surface water supplies. Provided the availability of the City's surface water portfolio is relatively stable on a long-term basis, the long-term reliability of its groundwater supplies will remain equally stable and reliable.

Therefore, given the manner in which the City manages its water supplies, and because the MEIR considered the historical variability of CVP water deliveries, executing the amendment to the contract is exempt from further CEQA review (filing a NOE is an appropriate course of action).

#### **FISCAL IMPACT**

The Settlement will result in some cost increase, which was already incorporated into the costs for water with the long-term Renewal Contract approved July 19, 2005. The Water Division's five year rate plan that was adopted by Council on February 27, 2007, includes the increase in costs. However, the Settlement includes several components that can potentially off-set these increases. First, there will be no direct pass through of the capital costs associated with implementing the settlement. Those direct costs will be paid from Federal appropriations (not requiring contractor repayment), state grants, local bond issues the debt service on which will be funded through existing CVP water supply revenues, and current CVPIA mandated environmental surcharges. The cost increase occurs because the Bureau will continue to impose the same operating and capital cost allocation on the contractors as it did absent the Settlement. But because the per acre foot charge is calculated based on the volume of water delivered, the actual per acre foot cost will increase because the average volume of water delivered will decrease.

To alleviate any detriment to contractors, the Settlement specifically provides that the Bureau will keep track of the amount of water each contractor is "shorted" through the Settlement. In those years when excess water is available, Friant contractors will have the first right to purchase the excess water at the fixed price of \$10 per acre-foot. Current fully burdened rate for CVP water is just under \$110 per acre-foot. Those contractors, like the City, that have the ability to take excess water in wet years (groundwater banking projects or recharge operations, for example) will be able to access the water at this very low cost, thereby reducing the overall cost of supplies.

Because the City has other reliably water sources and does not solely rely on its CVP water, the City also may off-set any potential cost increases through dry year transfers to those entities that have no alternative supplies. Again, the Bureau and the Friant contractors intend to focus their efforts on these transfers and exchanges as a part of implementing the Settlement.

Attachment:

Resolution Certifying Long-Term Renewal Contract Amendment for Execution

RESOLUTION NO. \_\_\_\_\_

A RESOLUTION OF THE COUNCIL OF FRESNO, CALIFORNIA, AUTHORIZING THE DEPARTMENT OF PUBLIC UTILITIES TO EXECUTE AN AMENDMENT TO THE LONG-TERM CENTRAL VALLEY PROJECT WATER SUPPLY CONTRACT AND FINDING SUCH ACTION EXEMPT FROM REVIEW UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

WHEREAS, on July 19, 2005, the City of Fresno renewed its contract with the United States Bureau of Reclamation ("Bureau") for the Friant Division, Central Valley Project water supply for an additional 40-year term ("Renewal Contract"); and

WHEREAS, prior to executing the Renewal Contract the Bureau completed its environmental review under the National Environmental Policy Act ("NEPA") and appropriate compliance with the Endangered Species Act; and

WHEREAS, prior to execution of the Renewal Contract, the City prepared an environmental assessment and initial study pursuant to the California Environmental Quality Act pursuant to Public Resources Code section 21000 et seq. ("CEQA"). Based on this analysis, the City determined the 2025 General Plan Master Environmental Impact Report No. 10130 ("MEIR") evaluated the potential impacts of the Renewal Contract and concluded that the execution of the Renewal Contract will not create new or additional impacts not previously assessed in the MEIR; and

WHEREAS, on July 19, 2005, the Fresno City Council approved and certified the finding of conformity (State Clearinghouse No. 20050110009) with the MEIR; and

WHEREAS, at the time the Renewal Contract was signed, there was ongoing litigation involving the San Joaquin River and the operation of Friant Dam (*Natural Resources Defense Council v. Patterson* (No. CIVS 88-1658-LKK-EM); referred to as the "Litigation"), which the City was not a party to; and

WHEREAS, Article 14(b) of the Renewal Contract provides that the terms of the Renewal Contract "are subject to any enforceable order, judgment, and/or settlement in NRDC v. Patterson, No. CIVS 88-1658-LKK-EM and shall be timely modified as necessary to effectuate or facilitate any final order, judgment or settlement in said litigation."; and

WHEREAS, on or about October 23, 2006, Judge Karlton, United States District Court, approved a settlement to the Litigation, which among other things, requires the City (and all other Friant contractors) to amend its Renewal Contract to conform to the settlement, as required in Article 14(b); and

WHEREAS, the Bureau has determined the amendments to the CVP contracts required under the settlement are exempted from review under the NEPA; and

WHEREAS, the proposed amendment to the Renewal Contract is exempt from CEQA because the execution of the amendment to the Renewal Contract is a ministerial action and results in no substantial changes to the Renewal Contract or significant impacts to the environment [CEQA Guidelines Section 15061(b)(3)]; and

WHEREAS, the proposed amendment to the Renewal Contract is exempt from CEQA because the City has only ministerial authority [Pub. Resources Code Section 21080(b)(1); Cal. Code of Regulations, Title 14, Chapter 3 (CEQA Guidelines) Section 15300.1] as the amendment was contemplated as part of the original agreement in 2005.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Fresno, based upon the documentation on file with the City, it makes the following findings:

- (1) Council finds that the execution of the amendment to the Renewal Contract is required by terms of the original Renewal Contract and that the Council's authorization of the Renewal Contract is not a discretionary decision; and
- (2) Council finds that the execution of the Renewal Contract is a ministerial action exempt from CEQA; and
- (3) Council finds, in accordance with its own independent judgment, that there is no substantial evidence in the record that the execution of the amendment to the Renewal Contract may have a significant effect on the environment beyond those disclosed in the previously certified Master Environmental Impact Report (MEIR); and
- (4) There are no substantial changes in circumstances that would result in new significant environmental effects because the original MEIR considered the possibility of obtaining less supply of water from the Friant Division project;

Accordingly, Council finds that the execution of the amendment to the Renewal Contract is exempt from CEQA, is hereby approved, and City staff is directed to file a notice of exemption with the State Clearinghouse.

Council further directs and authorizes the City Manager and the Director of the Department of Public Utilities to execute the amendment to the Renewal Contract.

\*\*\*\*\*

///

///

///

CLERK'S CERTIFICATION

STATE OF CALIFORNIA )  
COUNTY OF FRESNO ) ss.  
CITY OF FRESNO )

I, REBECCA E. KLISCH, City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, California, at a regular meeting held on the \_\_\_\_\_ day of \_\_\_\_\_, 2007.

AYES:  
NOES:  
ABSENT:  
ABSTAIN:

Mayor Approval: \_\_\_\_\_, 2007

Mayor Approval/No Return: \_\_\_\_\_, 2007

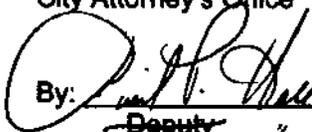
Mayor Veto: \_\_\_\_\_, 2007

Council Override Vote: \_\_\_\_\_, 2007

REBECCA E. KLISCH  
City Clerk

\_\_\_\_\_  
Deputy

APPROVED AS TO FORM:  
City Attorney's Office

By:  \_\_\_\_\_  
Deputy Chief Assistant.

1  
2  
3  
4  
5  
6 UNITED STATES  
7 DEPARTMENT OF THE INTERIOR  
8 BUREAU OF RECLAMATION  
9 Central Valley Project, California

10 AMENDMENT TO LONG-TERM RENEWAL CONTRACT BETWEEN  
11 THE UNITED STATES  
12 AND  
13 CITY OF FRESNO  
14 PROVIDING FOR PROJECT WATER SERVICE FROM FRIANT DIVISION  
15

16 THIS CONTRACT AMENDMENT, is made this 16<sup>th</sup> day of

17 April, 2007, in pursuance generally of the Act of Congress of June 17,  
18 1902 (32 Stat. 388), and the acts amendatory thereof or supplementary thereto, including,  
19 but not limited to, the Acts of August 26, 1937 (50 Stat. 844), as amended and supplemented,  
20 August 4, 1939 (53 Stat. 1187), as amended and supplemented, July 2, 1956 (70 Stat. 483),  
21 June 21, 1963 (77 Stat. 68), October 12, 1982 (96 Stat. 1263), October 27, 1986  
22 (100 Stat. 3050), as amended, and Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706),  
23 all collectively hereinafter referred to as Federal Reclamation law, between  
24 THE UNITED STATES OF AMERICA, hereinafter referred to as the United States, and,  
25 CITY OF FRESNO, hereinafter referred to as the Contractor, a public agency of the State of  
26 California, duly organized, existing, and acting pursuant to the laws thereof;

27 WITNESSETH, That:

28 EXPLANATORY RECITALS

29 [1<sup>st</sup>] WHEREAS, the United States and the Contractor entered into a contract  
30 dated August 18, 2005, designated Contract No. 14-06-200-8901-LTR1, providing for water  
31 service from the Central Valley Project, hereinafter referred to as the "Existing Contract;" and

32 [2<sup>nd</sup>] WHEREAS, pursuant to subdivision (b) of Article 14 of the Existing  
33 Contract, the terms of the Existing Contract are subject to any enforceable order, judgment and/or  
34 settlement in *NRDC v. Patterson*, No. CIVS 88-1658-LKK-EM (now styled *Natural Resources*  
35 *Defense Council, et al. v. Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH) and that the Existing  
36 Contract shall be timely modified as necessary to effectuate or facilitate any final order, judgment  
37 or settlement in said litigation; and

38 [3<sup>rd</sup>] WHEREAS, the parties to said litigation have reached agreement on a  
39 global resolution of all Claims for Relief in the Seventh Amended Complaint, on the terms and  
40 conditions stated in the Stipulation of Settlement dated September 13, 2006, designated Exhibit I  
41 in the Order Approving Stipulation dated October 23, 2006; and

42 [4<sup>th</sup>] WHEREAS, the parties hereto desire to amend the Existing Contract as  
43 required by said Stipulation of Settlement.

44 NOW, THEREFORE, in consideration of the mutual and dependent covenants  
45 herein contained, it is hereby agreed as follows:

46 I. Subdivision (a) of Article 3 of the Existing Contract is deleted in its entirety, and  
47 the following is substituted in lieu thereof:

48           “(a) During each Year, consistent with all applicable State water rights, permits, and  
49 licenses, Federal law, and the Stipulation of Settlement dated September 13, 2006,  
50 the Order Approving Stipulation of Settlement, and the Judgment and further orders  
51 issued by the Court pursuant to terms and conditions of the Settlement in  
52 *Natural Resources Defense Council, et al. v. Rodgers, et al.*, No. CIV-S-88-1658  
53 LKK/GGH, and subject to the provisions set forth in Articles 11 and 12 of this  
54 Contract, the Contracting Officer shall make available for delivery to the Contractor  
55 60,000 acre-feet of Class 1 Water for M&I purposes. The quantity of Water Delivered  
56 to the Contractor in accordance with this subdivision shall be scheduled and paid for  
57 pursuant to the provisions of Articles 4 and 7 of this Contract.”

58           2.       Subdivision (a) of Article 11 of the Existing Contract is deleted in its entirety, and  
59 the following is substituted in lieu thereof:

60           “(a) Subject to: (i) the authorized purposes and priorities of the Project and the  
61 requirements of Federal law, and the Stipulation of Settlement dated September 13,  
62 2006, the Order Approving Stipulation of Settlement, the Judgment and further  
63 orders issued by the Court pursuant to terms and conditions of the Settlement in  
64 *Natural Resources Defense Council, et al. v. Rodgers, et al.*, No. CIV-S-88-1658  
65 LKK/GGH and (ii) the obligations of the United States under existing contracts, or  
66 renewals thereof, providing for water deliveries from the Project, the Contracting  
67 Officer shall make all reasonable efforts to optimize Project Water deliveries to the  
68 Contractor as provided in this Contract.”

69           3.       Subdivision (h) of Article 12 of the Existing Contract is deleted in its entirety, and  
70 the following is substituted in lieu thereof:

71           “(b) If there is a Condition of Shortage because of errors in physical operations of the  
72 Project, drought, other physical causes beyond the control of the Contracting Officer or  
73 actions taken by the Contracting Officer to meet legal obligations, including but not  
74 limited to obligations pursuant to the Stipulation of Settlement dated September 13,  
75 2006, the Order Approving Stipulation of Settlement, the Judgment and further  
76 orders issued by the Court pursuant to terms and conditions of the Settlement in  
77 *Natural Resources Defense Council, et al. v. Rodgers, et al.*, No. CIV-S-88-1658  
78 LKK/GGH then, except as provided in subdivision (a) of Article 18 of this Contract,  
79 no liability shall accrue against the United States or any of its officers, agents, or  
80 employees for any damage, direct or indirect, arising therefrom.”

81           4.       Subdivision (b) of Article 14 of the Existing Contract is deleted in its entirety, and the  
82 following is substituted in lieu thereof:

83           “(b) The terms of this Contract are subject to the Stipulation of Settlement dated  
84 September 13, 2006, the Order Approving Stipulation of Settlement, the Judgment and  
85 further orders issued by the Court pursuant to terms and conditions of the Settlement in  
86 *Natural Resources Defense Council, et al. v. Rodgers, et al.*, No. CIV-S-88-1658  
87 LKK/GGH. Nothing in this Contract shall be interpreted to limit or interfere with the  
88 full implementation of this Settlement, Order, the Judgment and further orders issued  
89 by the Court pursuant to terms and conditions of the Settlement.”

90 5. Except as specifically amended herein, the Existing Contract is valid and shall  
91 continue in full force and effect as originally written and executed.

92 IN WITNESS WHEREOF, the parties hereto have executed this Contract  
93 Amendment as of the day and year first above written.

94 APPROVED AS TO LEGAL  
FORM AND SUFFICIENCY  
*James E. Turner*  
95 OFFICE OF REGIONAL SOLICITOR  
96 DEPARTMENT OF THE INTERIOR  
97

THE UNITED STATES OF AMERICA  
*[Signature]*  
By: \_\_\_\_\_  
Regional Director, Mid-Pacific Region  
Bureau of Reclamation

98 CITY OF FRESNO  
99 (SEAL)  
100 By: *Andrew T. Young*  
101 City Manager

102 By: *[Signature]*  
103 Public Utilities Director  
104

104 Attest:  
105 By: *Elvira Somerville*  
106 City Clerk (3/26/07)

107 Approved as to form:  
108 By: *[Signature]*  
109 City Attorney

## **APPENDIX D3**

---

**FID Contract**



APPENDIX D

COOPERATIVE AGREEMENT BETWEEN FRESNO IRRIGATION DISTRICT AND CITY OF FRESNO FOR WATER UTILIZATION AND CONVEYANCE

FRESNO COUNTY, CALIFORNIA  
MAY 25 1976  
H. L. MASINI, County Recorder

1 THIS AGREEMENT, entered into as of this 25th day of  
2 May, 1976, by and between the FRESNO IRRIGATION  
3 DISTRICT, a public corporation, (herein called the "DISTRICT"),  
4 and the CITY OF FRESNO, a municipal corporation, (herein called  
5 "CITY");

W I T N E S S E T H:

6 WHEREAS, Fresno Irrigation District is an irrigation dis-  
7 trict organized and existing under the laws of the State of  
8 California and is the owner of certain water rights and a water  
9 distribution system for the distribution of water within the  
10 District, and the City of Fresno is a municipal corporation  
11 wholly within the exterior boundaries of said District and is  
12 the owner of a water distribution system delivering water to  
13 lands both in and outside the exterior boundaries of said City;  
14 and

15  
16 WHEREAS, District and City have heretofore entered into  
17 a cooperative program of water utilization between said parties  
18 evidenced by a written agreement for such water utilization and  
19 conveyance dated August 12, 1970, which by its terms and by the  
20 terms of amendments thereto will terminate on May 30, 1975; and

21 WHEREAS, District and City wish to continue with said  
22 cooperative program and to make and enter into a new contract for  
23 water utilization and conveyance, and

24 WHEREAS, this agreement is specifically authorized by, and  
25 entered into pursuant to Chapter 9 (commencing with Section 26670)  
26 Part 19, Division 11 of the California Water Code, and

27 WHEREAS, by agreement dated January 12, 1961, between City  
28 and the United States of America (herein called the "City Bureau  
29 Contract"), City is required and/or is entitled to purchase  
30 certain water herein called City's Bureau Water from the United  
31 States, commencing in 1966; and

32  
////

To be recorded without fee on behalf of Fresno Irrigation District & City

1 WHEREAS, the District has entered into certain contracts  
 2 with the United States (herein called the "District Bureau  
 3 Contracts") for a supplemental supply of water from the Friant-  
 4 Kern Canal and for storage in Pine Flat Reservoir on the Kings  
 5 River, which said District Bureau Contracts are more particularly  
 6 described as follows:

- 7 Contract Between the United States of America  
 8 and Fresno Irrigation District Providing for  
 9 the Payment of the District's Share of the  
 10 Cost of Pine Flat Dam and Reservoir Allocated  
 11 to Irrigation, dated December 23, 1963,
- 12 Contract for Operation and Maintenance of  
 13 Irrigation Storage Space of Pine Flat  
 14 Reservoir, dated December 23, 1963,
- 15 Kings River Allocation Contract, dated  
 16 December 23, 1963,
- 17 Contract between the United States and Fresno  
 18 Irrigation District Providing for Water  
 19 Service, dated July 20, 1964,
- 20 Conveyance and Covenants in Compromise and  
 21 Settlement of Fresno Slough Claims, dated  
 22 April 23, 1965,

23 and has entered into other contracts with the members of the  
 24 Kings River Water Association (herein called the "District Intra-  
 25 Association Agreements"), relating to Kings River and storage in  
 26 Pine Flat Reservoir, which said contracts are more particularly  
 27 described as follows:

- 28 Water Right Indenture, dated May 3, 1927,
- 29 Administrative Agreement and Monthly Diversion  
 30 Schedule dated May 3, 1927,
- 31 Agreement Supplementing and Amending Water  
 32 Right Indenture Dated May 3, 1927, and  
 Supplementing and Amending Administrative  
 Agreement Dated May 3, 1927, Relating to  
 Kings River Water Association, and Amended  
 Monthly Diversion Schedule, dated June 1, 1949,
- Agreement Admitting Kings River Water District  
 As a Member of Kings River Water Association  
 and Agreement Re: Centerville Bottoms  
 Schedule, dated September 10, 1963,

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32

Agreement Supplementing and Amending Water Right Indenture Dated May 3, 1927, and Administrative Agreement Dated May 3, 1927, Each as Amended and Supplemented June 1, 1949, Relating to Kings River Water Association, dated September 10, 1963, and

WHEREAS, it is recognized by District and City that the District is primarily charged with the distribution and delivery of water within the District for agricultural use and that its canals and distribution system must primarily be used for that purpose, and

WHEREAS, it is recognized by both the District and the City that many inhabitants of the District also require water for domestic, industrial or fire protection purposes which may be supplied to them by the City, and

WHEREAS, it is recognized by District and City that both are charged with the protection and preservation of the underground water supply;

NOW, THEREFORE, it is mutually agreed as follows:

1. Term. The term of this agreement shall be for a period commencing on the date it is executed and ending at 12:00 o'clock p.m. on the last day of February in the year 1980 and thereafter, until terminated by either party as of the last day of February of any subsequent year by written notice to the other party mailed prior to September 1st of the previous year. Forthwith upon the execution of this agreement the previous agreement between the parties above referred to dated August 12, 1970, and all amendments thereto shall be terminated and shall be of no further force or effect, except that City agrees to pay District any monies owing or to become owing to District under and according to the terms of said previous agreement.

2. Approval by United States. Immediately upon the execution of this contract by the parties hereto, it shall be

////

1 presented to the United States for its approval and in the event  
2 of its disapproval by the United States it shall become in-  
3 effective and unenforceable for any purpose until such approval  
4 has been obtained.

5 This contract shall be at all times subject to all of the  
6 terms and conditions of the City Bureau Contract, the District  
7 Bureau Contracts and the District Intra-Association Agreements  
8 and to the extent that any agreement contained herein is con-  
9 trary to or inconsistent with any term or condition of those  
10 contracts or agreements, this contract shall be unenforceable.  
11 In the event any such agreement contained herein shall become  
12 unenforceable, the entire contract may be terminated by the  
13 party adversely affected as of the last day of February of the  
14 next succeeding year, by written notice served upon the other  
15 party on or before the first day of September of the year pre-  
16 ceding such termination.

17 3. Definition. For the purpose of this agreement, the  
18 following words shall be defined as follows:

- 19 a. "City Water Service Area" means all lands within  
20 the city limits of the City of Fresno, and also  
21 all lands outside the city limits of the City  
22 of Fresno which are within the exterior  
23 boundaries of District to which the City now  
24 delivers water or hereafter consents to deliver  
25 water by means of its City Water System and  
26 which are not hereafter designated or assessed  
27 by the District as lands receiving or to  
28 receive District Water Service from the District
- 29 b. "Included Area" means that portion of the City  
30 Water Service Area which is a part of the District.  
31  
32

////

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32

- c. "Excluded Area" means that portion of the City Water Service Area which is not a part of the District.
- d. "City Water System" means the conduits, pipes and other facilities owned by the City and used by the City to convey water to lands whether in or outside the City.
- e. "District Water Service" means the furnishing of water by the District directly to lands within the District by means of canals, ditches or pipelines owned or under the control of the District, or by any means under the control of the District other than pumping conducted by the water user directly from the underground water supply upon the lands receiving such water.
- f. "Surface Water Supply" means all water available or received by any means other than pumping from the underground water supply.
- g. "Agricultural Use" means the use of water primarily in the production of agricultural crops or livestock including but not restricted to domestic use incidental to such agricultural purposes, the watering of livestock and underground water replenishment.
- h. "Municipal, Industrial and Domestic Uses" means the use of water other than for Agricultural Use.
- 1. "Water Year" means October 1st of one year through September 30th of the next year.
- 4. Determination of Areas. A map showing the City Water Service Area, the Included Area and the Excluded Area and clearly indicating the total number of acres in each area

////

1 as of the first day of March, 1976, entitled "City Water Service  
2 Area, Included Area and Excluded Area as Defined in Cooperative  
3 Agreement Between Fresno Irrigation District and City of Fresno,"  
4 shall be prepared in duplicate by the Water Division of the City  
5 of Fresno and approved in duplicate and in writing upon said map  
6 by the Director of Public Works of the City and by the Manager  
7 of the District. When so approved, said map shall be in-  
8 corporated herein by reference as Exhibit A and shall become a  
9 part hereof. One duplicate so approved shall be kept in the  
10 office of the City and one in the office of the District. Said  
11 map shall be amended and reapproved by both parties as of the  
12 first day of March, 1977, and as of the first day of March of  
13 each succeeding year thereafter; provided, however, that the  
14 City shall keep the District currently advised on a monthly  
15 basis of any new lands outside of the Fresno City Limits to  
16 which it commences or consents to deliver water and the District  
17 shall keep the City so advised as to any new lands designated  
18 or assessed by it as lands receiving or to receive District  
19 Water Service. When so amended and reapproved as of the first  
20 day of March of each year, said map shall conclusively establish  
21 the boundaries of and the acreage in each area for all purposes  
22 of this agreement.

23 In computing the acreage in each of the areas above  
24 referred to, the entire acreage shall be measured including  
25 properties that may be exempt from assessment for taxation and  
26 including adjacent streets, alleys, roads, highways and other  
27 public ways to the center lines thereof.

28 Said map shall also show the area within which the  
29 District's water shall be made available to the City under  
30 Paragraph No. 6 hereof. Said area shall be designated on said  
31 map as "District's Water Delivery Area".  
32

////

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32

5. Payment by City to District. The City shall pay to the District each year in which this contract is effective, in lieu of assessments by the District upon lands in the Included Area (pursuant to Water Code Section 26671, subdivision ) b) a total sum of money calculated as follows:

a. A sum calculated by multiplying the number of acres in the Included Area as of the first day of March of that year by the assessed value per acre generally assigned by the District in that year to other lands in the District receiving District Water Service (not including the assessed value assigned to lands where the service is obtained by the pumping of water from the District's canals) multiplied by the assessment rate determined by the District in that year for the next year's District operations, and also

b. A sum calculated by multiplying the number of acres in the Excluded Area as of the first day of March of that year by the assessed value per acre generally assigned by the District in that year to other lands in the District (not including lands in Preewater County Water District, or lands annexed from Trimmer Springs Water District or other lands which for any reason are subject to specially assessed valuations) which do not receive District Water Service, multiplied by the assessment rate determined by the District in that year for the next year's District operations.

Said payment shall be paid each year as follows:

60% of each said payment shall be paid on or before the 20th day of December, and the remaining 40% shall be paid on or before the 20th day of June, of the next succeeding year.

////

1 In the event of the disapproval of this agreement by the United  
2 States or of any other termination of this agreement during any  
3 calendar year, the total amount to be paid on or before  
4 December 20th of that year and/or June 20th of the next year  
5 shall still be paid.

6 Time shall be of the essence for the making of the above  
7 payments. If any such payment is not made on the date provided,  
8 the City shall pay to the District in addition to said payment  
9 costs and penalties equal to those provided by law to be paid by  
10 landowners within the District for the late payment of assess-  
11 ments. These penalties are in addition to any other remedy  
12 which the District may have against the City because of the City's  
13 failure to pay said payment as above provided.

14 6. Water Made Available to City. Subject to all other  
15 provisions of this agreement, the District shall make available  
16 to the City during each calendar year (pursuant to Water Code  
17 Section 26671, subsection 2) for distribution and use within the  
18 Included Area of the City, at such times as shall be determined  
19 by the Manager of the District, that proportion of the total  
20 water diverted by the District from the Surface Water Supply  
21 available to it for such year, as the acreage of the Included  
22 Area, appearing on the map designated as Exhibit A, as of the  
23 first day of March preceding that water year, bears to the  
24 acreage of the total area in the District (including the Included  
25 Area) receiving a Surface Water Supply from the District. Said  
26 water shall be made available to the City in the District's  
27 canals at such point or points along such canals within the area  
28 designated on Exhibit A as "District's Water Delivery Area" as  
29 may be designated by the City and approved by the District and  
30 shall be taken from the District's canals by and at the expense  
31 of the City in a manner approved by District. The City must ac-  
32

////

1 reasonably in designating such points or points of delivery and  
2 the District must act reasonably in approving or disapproving  
3 such point or points of delivery. The District shall not be  
4 required to make such water available to the City at any point or  
5 points which will interfere with the operation or maintenance  
6 of the District's distribution system or water delivery schedule.  
7 Such water may be used by the City only within the Included Area  
8 for Municipal, Industrial and Domestic Uses and for Agricultural  
9 Uses incidental thereto, and within the District's Water Delivery  
10 Area for recharge of the underground water supply by percolation.

11 No water which has been received by the District either  
12 as Class 1 or Class 2 water under its contract with the United  
13 States for water service from the Friant-Kern Canal, dated  
14 July 20, 1964, or which has been stored by the District in Pine  
15 Flat Reservoir under the District's contracts with the United  
16 States providing for such storage, dated December 23rd, 1963,  
17 shall be made available to the City.

18 The City shall not sell, transfer or exchange any of  
19 said water to or with any other person or entity. However, this  
20 provision shall not prevent the City from entering into separate  
21 agreements with any other entity which may have a similar  
22 agreement with the District for the distribution and use of  
23 water received from the District under such agreements, provided  
24 such separate agreements are entered into with the written  
25 consent of the District first had and obtained and are subject  
26 to all the terms and conditions of this agreement and the  
27 District's agreements with such other entities.

28 7. Water Entitlements of Lands in Included Area. The  
29 owners of lands within the Included Area covered by this agree-  
30 ment shall each year be entitled to receive and use from the  
31 water so made available by the District to the City, or from  
32

////

1 other water available to the City, an amount of water sufficient  
 2 to supply his reasonable and beneficial needs, limited however to  
 3 his proportionate share of the water made available by the  
 4 District to the City under this agreement based upon the ratio  
 5 which the number of acres owned by him bears to the total number  
 6 of acres of land within the Included Area. The City may charge  
 7 such rates as it may determine for the service of water to such  
 8 lands; provided, however, no distinction shall be made between  
 9 the rate charged for water received by the City from the District  
 10 under this agreement and water obtained by the City from other  
 11 sources.

12       8. Conveyance of City's Bureau Water. Under the City's  
 13 contract with the United States providing for Water Service,  
 14 dated January 12, 1961, the City may, under the circumstances  
 15 therein provided, decrease the quantity of City's Bureau Water  
 16 required to be furnished each year to the City by the United  
 17 States pursuant to said contract. City agrees that so long as  
 18 this contract with District remains in effect, it will not  
 19 decrease the quantity of City's Bureau Water to be accepted and  
 20 paid for by it under Schedule A in Paragraph 3(A) of said  
 21 contract with the United States, without the consent of District.

22       At the request of the City, the District shall convey  
 23 for the City, in the District's canals, all or such portion  
 24 of the City's Bureau Water which the City shall receive from  
 25 the United States under the City Bureau Contract and which is  
 26 not conveyed by other means. City's Bureau Water shall be  
 27 taken into the District's canals at the diversion point or  
 28 points on the Friant-Kern Canal where water is delivered to the  
 29 District or the City under their agreements with the United  
 30 States, and shall be conveyed in such canals and delivered to the  
 31 City at such points along such canals as may be designated by the  
 32

///

1 City and approved by the District. The City must act reasonably  
2 in designating such point or points of delivery and the District  
3 must act reasonably in approving or disapproving such point or  
4 points of delivery. The District shall not be required to make  
5 such water available to the City at any point or points which  
6 will interfere with the operation or maintenance of the District's  
7 distribution system or water delivery schedule. Such water shall  
8 be received by the City in the District's canals and taken from  
9 the District's canals by and at the expense of the City in a  
10 manner approved by the District.

11 It is agreed that if and when the City shall establish a  
12 diversion point and/or facility of its own on the Friant-Kern  
13 Canal for the purpose of receiving its Bureau Water, the District  
14 shall have the right to use said diversion facility for its own  
15 purposes as well as for the purpose of receiving the City's  
16 Bureau Water for conveyance into the District, providing that  
17 City's Bureau Water shall take precedence of use of the diversion  
18 facility.

19 Whenever the City's Bureau Water is requested by the City,  
20 the District shall have the right to exchange and to convey for the  
21 City in place thereof other water in similar quality and equal  
22 quantity at the point of delivery (except sewer effluent or indus-  
23 trial wastes) available to the District, and to take and use such  
24 water available under the City's Bureau Contract for its own uses  
25 at such times and in such manner as may be determined by the District.

26 It is understood that the conveyance by the District of  
27 its own water to landowners served by it within the District  
28 (including lands within the City in the Included Area) shall  
29 have priority over the conveyance of the City's Bureau Water and  
30 that nothing herein contained shall require the District to  
31 convey City's Bureau Water at any time when, because of lack of  
32 canal capacity or otherwise, the conveyance of such water would

////

1 make it impossible or impractical for the District to convey its  
2 own water upon the schedules established by the District. How-  
3 ever, it is understood that in determining whether at any time  
4 the District's canals have the capacity to convey the City's  
5 Bureau Water, the conveyance of that water shall have priority  
6 over the conveyance of any water brought into the District by  
7 the City of Clovis, or the Fresno County Waterworks District  
8 No. 19, or any other entity with which the District may have a  
9 similar contract; provided, however, that in the event additional  
10 canal capacity is provided by the City or any other such entity  
11 at its expense to accommodate its own water, that entity's water  
12 shall have priority in that additional space.

13 If it becomes necessary, the City and the District will  
14 consider the enlargement of the District's canals for the pur-  
15 pose of conveying City's Bureau Water, the City to pay that  
16 portion of the cost of such enlargement as is for its benefit.  
17 In the event of such enlargement, all lands or easements acquired  
18 in connection therewith, and all additions or improvements in or  
19 to the District's canals shall become the property of the  
20 District but the City shall have priority in the use of such  
21 additional capacity during the term of this contract. The  
22 District shall not be bound to so enlarge any of its said canals,  
23 and neither party shall be required to participate in or pay for  
24 any such enlargement, without its consent.

25 9. Schedules of Delivery and Conveyance of Water. The  
26 District will make available to and convey for the City the  
27 water herein agreed to be made available to the City pursuant  
28 to paragraph 6, at such times during the water year as shall be  
29 determined by the District. Insofar as practicable and feasible,  
30 the District will attempt to make such water available to City  
31 from the District's water supply on the same water schedule that  
32

///

1 other landowners in the District receive water and in such a  
2 manner as to provide the same in a continuous flow at all times  
3 when water is running in the canal or canals by which such water  
4 is conveyed for the City's use, but in making such determination  
5 the District will take into consideration the capacity and  
6 condition of said canals, the availability of water which may be  
7 taken or used by the City under the terms of this agreement and  
8 under the terms of the District's contracts with the United  
9 States and the rules, regulations and directives of the Bureau of  
10 Reclamation in connection therewith, the needs and requirements  
11 of other landowners in the District, including the needs and  
12 requirements of excess landowners, the entitlements of the  
13 District to natural flow or unstored water from the Kings River,  
14 the requirements of the contracts between the District and the  
15 City of Clovis and Fresno County Waterworks District No. 19 and  
16 all other factors pertaining to the distribution, apportionment  
17 and use of water available to the District. Such delivery and  
18 conveyance schedules may be adjusted from time to time by the  
19 District in a manner reasonably calculated to best serve the needs  
20 of the District and the City.

21 Subject to the same limitations of feasibility, the  
22 District will convey City's Bureau Water at such times as the  
23 City may request; provided, however, that the District shall  
24 not be required to convey water for the City in any canal at  
25 any time when work is being done upon said canal for construction,  
26 improvement or maintenance and if the City requests the District  
27 to convey water in any canal during any time when water is not  
28 being run in said canal for other landowners, the District may  
29 condition the conveyance of its said water upon payment by the  
30 City of any additional cost incurred by the District because  
31 thereof.

32

////

1           10. Conveyance Losses. The City shall assume and bear  
2 all conveyance losses for all water furnished by the District to  
3 the City or conveyed by the District for the City under this  
4 agreement. Conveyance losses chargeable to the City shall be  
5 computed by multiplying the losses in that portion of any canal  
6 used for such conveyance, during the period such water is being  
7 so conveyed, by the total amount of water being conveyed for  
8 the City in that canal during such time, divided by the total  
9 amount of water flowing in that portion of that canal during the  
10 same period.

11           11. Use by District of Water Not Used by City. In the  
12 event the City is unable to use or does not use any part of the  
13 water made available to it by the District within the area  
14 designated on Exhibit A as "District's Water Delivery Area" under  
15 this agreement for the purposes, at the times and in the manner  
16 herein provided, the City shall lose the right to receive such  
17 water, and the District shall have the right to take and use such  
18 water for purposes of irrigation and percolation in such manner as  
19 it may determine. In such event, insofar as the canals and  
20 facilities of the District will permit, and insofar as otherwise  
21 may be practicable and equitable as to other landowners, the  
22 District will use such water for irrigation or percolation in areas  
23 in the City or east or northeast of the City, and will discuss its  
24 use with the City before it is used elsewhere. However, the  
25 ultimate decision concerning such use of such water shall be  
26 within the discretion of the District.

27           In the event the City is unable to use or does not use any  
28 part of City's Bureau Water it is required to take under its  
29 City Bureau Contract when and as required under that contract  
30 or under the terms of this agreement, the City shall nevertheless  
31 take and pay for said water and the District shall have the right  
32 to use such water for purposes of irrigation and percolation but

////

1 the City may require the District to so use such water at such  
2 locations as it may direct; provided, however, in the event the  
3 City does not direct the location at which said water shall be  
4 used in time that it may be so used or in the event the canals  
5 and facilities of the District will not permit the conveyance of  
6 such water to such location when so directed, or if for any  
7 other reason the conveyance of such water to such location at  
8 that time is not feasible or practicable, District shall have  
9 the right to use such water upon the same conditions as are  
10 provided in the previous paragraph for water made available to  
11 the City by the District.

12 Such use of any such water by the District as provided in  
13 this paragraph shall not relieve the City from any payments  
14 required to be made by it under the City Bureau Contract or  
15 under the terms of this agreement and its use by the District  
16 shall not require any payment from the District to the City.

17 12. Water Rights Not Transferred. Nothing in this agree-  
18 ment authorizes or shall be construed or deemed to constitute the  
19 sale or transfer of a water right from either party to the other.

20 13. City's Sewage Effluent. The City will retain its  
21 sewage effluent within the boundaries of the District for the  
22 term of this contract, except with the written consent of the  
23 District first had and obtained.

24 14. No Warranty of Quality. The character or quality of  
25 the water furnished or conveyed hereunder may vary from time to  
26 time for reasons including, but not restricted to, the application  
27 by the United States or the District of toxic chemicals to  
28 control aquatic and ditch bank weeds, and the open canals of the  
29 District are always subject to possible pollution from outside  
30 sources. The District does not guarantee in any respect or  
31 assume any responsibility for the chemical, bacterial or other  
32

////

1 quality of the water made available to the City or conveyed for  
2 the City through the District's facilities.

3 15. Indemnity. The City and the District each agree to  
4 indemnify the other and save the other free and harmless of and  
5 from any and all liability, damage, loss, cost or expense,  
6 incurred or suffered by the other, by reason of damage to the  
7 property of the other or injury to any other person or property  
8 arising out of its own conduct, acts, omissions or faults, in  
9 connection with any matter related to this contract.

10 CITY OF FRESNO, A Municipal  
11 Corporation

12 By: [Signature]  
13 Title: Director of Public Works

14 Attest:

15  
16 [Signature]  
17 City Clerk

18 (City)

19 FRESNO IRRIGATION DISTRICT

20 APPROVED AS TO FORM  
21 SPENCER THOMAS, JR., City Attorney

22 By Wayne N. Witchy  
23 Assistant

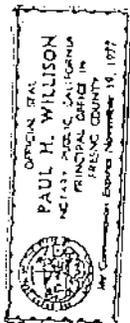
22 By: F. A. Preuss  
23 President

23 Date MAY 20 1976

23 Attest: [Signature]  
24 Secretary

(District)

State of California,  
County of Fresno



16. On this 25th day of May, 1976, in the year one thousand nine hundred and seventy-six before me, Paul H. Willison, a Notary Public in and for said County and State, residing therein, duly commissioned and sworn personally appeared, F. A. Preuss, known to me to be the President, and Ardys T. Gorder, known to me to be the Secretary of the Fresno Irrigation District, the corporation that executed the within instrument, and known to me to be the person who executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the within instrument pursuant to its by-laws or a resolution of its board of directors. IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at my office in said County, the day and year in this Certificate above written.

[Signature]  
Notary Public in and for said County and State

## **APPENDIX E**

---

### **Fresno Area Regional Groundwater Management Plan**

## **APPENDIX F**

---

### **Municipal Code Provisions**



**MUNICIPAL CODE OF THE CITY OF FRESNO  
CHAPTER 6. MUNICIPAL SERVICES AND UTILITIES  
ARTICLE 5. WATER REGULATIONS**

The following sections of the Municipal Code of the City of Fresno address water conservation issues:

- Section 6-519. Water Conservation Device Required
- Section 6-520: Wastage of Water
- Section 6-522: Water Efficient Landscape Standards
- Section 6-523: Definitions for Water Efficient Landscape Standards

The full text of each of these sections follows.

**SEC. 6-519. WATER CONSERVATION DEVICE REQUIRED.**

(a) No person shall install or replace any system, including portable systems, on any premises unless such system is equipped with a water conservation device, and such device is properly maintained at all times, except as follows:

(1) In a multi-story building, unconserved water-cooled refrigeration units used only for the commercial preservation of food may be installed, replaced or maintained provided that such unit has a capacity of less than one ton and that all such units on any one premises do not exceed a cumulative total capacity of two tons and do not consume more than 1.5 gallons of water per minute per ton of capacity per unit.

(2) Evaporative coolers may be installed, replaced, or maintained provided that no evaporative cooler or coolers on any premises shall have a cumulative total capacity of more than eighteen hundred cubic feet of air per minute.

(3) A system may be installed, replaced or maintained provided it is not connected to city water, and a source of water supply is developed on the same premises for the exclusive use of such system, and a drainage well, drilled pursuant to and in conformance with Article 4 (commencing with Section 6-401), Chapter 6, of this Code, is used as the sole means of disposing of water discharged from such system.

(b) When a system is installed or maintained on any premises contrary to the provisions of this article, no city water service shall be granted to serve said premises, whether located in or out of the city limits.

(c) No person shall sell or deliver any evaporative cooler which he knows or has reason to know is intended to use city water unless such cooler is, when sold and delivered, equipped with a water conservation device. (Added Ord. 73-120, § 5, eff. 8-16-73).

**SEC. 6-520. WASTAGE OF WATER.**

(a) In the use of water supplied by the city, no customer shall do or permit any of the following:

- (1) Water any lawn except by use of a hose held in the person's hand or a sprinkling device, or
- (2) Keep, maintain, operate, or use any water connection, hose, faucet, hydrant, pipe, outlet, or plumbing fixture which is not tight and free from leakage, or
- (3) Willfully or negligently waste water, or
- (4) Flood any part of the premises of another, or
- (5) Sprinkle the premises of another so as to prevent the normal use thereof or unreasonably wet objects thereon which should not be subjected to a spray of water except as naturally caused by the elements or by action of the owner of the object, or
- (6) Sprinkle or irrigate any yard, ground, premise, or vegetation between the hours of twelve o'clock and five o'clock p.m. during the months of April through October, inclusive, or
- (7) Sprinkle or irrigate any yard, ground, premise, or vegetation unless the watering device used is controlled by an automatic shut-off device, or a person is in immediate attendance of the hose or watering device, or
- (8) Wash any privately owned motor vehicle, trailer, or boat except from a bucket or in a commercial car wash, provided a hose equipped with a shut-off nozzle may be used for a quick rinse, or
- (9) Wash or rinse with a hose or watering device any sidewalk, driveway, parking area, tennis court, patio, or any other exterior paved area, except in a manner which prevents the bulk of the runoff water from entering the street and instead diverts such water to other productive purposes such as landscape irrigation.

(b) Lawn sprinkling systems shall be properly designed, installed, maintained, and operated to prevent wastage of water.

(c) The Council may implement any or all of the measures listed below, either city-wide or by specific zone, when any of the following conditions exist: (i) the California Department of Water Resources has declared a critically dry or drought year; or (ii) water levels decline below the pump intake; or (iii) water pressures drop below thirty-five pounds per square inch during peak demand periods more than three days in any calendar week or ten days in any calendar month; or (iv) degradation of water quality condition (i.e., exceeding the established maximum contaminant levels according to applicable state or federal law) decreases water quantity available for delivery to all or part of the geographic area, or the customers and other persons, for whom Water Division service was designed or intended to the extent extraordinary measures to reduce water use are necessary, as determined by the Council. Measures to be implemented include, but are not limited to, the following:

- (1) Odd/even address alternate day outdoor watering restrictions for all or a specific zone of the city (in addition to the time of day restrictions set forth in Section 6-520(a)(6)). The following properties shall water by using each irrigation valve no more frequently than every other day:
  - a. Properties with multiple addresses, and
  - b. Properties turfed or landscaped areas of three acres or larger, and
  - c. Properties without street addresses.

The owners of such properties may apply for an exemption from the established watering restrictions. The owners of such properties shall be required to submit a proposed watering schedule in writing to the Water Division for approval or modification. The Water Division may approve a watering schedule that may provide for more frequent watering than every other day. If it is determined that the property can be watered within the city's regular watering rules without significantly impacting water pressures in the service area, the proposed watering schedule will be denied. The Council may grant an exemption for new lawns not yet established.

(2) Prohibition of all irrigation of turf for all or a specific zone of the city except during off-peak hours (twelve midnight to six a.m., eight a.m. to eleven a.m. and seven p.m. to twelve midnight). The Council may grant an exemption for new lawns not yet established.

(3) Implementation of regulations on the filling of fountains in city facilities, as the Council determines appropriate.

(4) Prohibition of installation of outdoor evaporative "mist coolers."

(5) Prohibition of draining of swimming pools more than once every three years, except for structural repairs or to comply with public health standards determined by the County Health Officer. Any customer whose swimming pool is drained by order of the department of health for failure to maintain it properly will also

be issued a notice of violation of the city of Fresno municipal code. The draining of pools for reasons of health and safety hazards as determined by the city of Fresno water division and/or the department of health is permitted. Residents with private swimming pools shall file a written application for a permit prior to draining their pools with the Water Division Manager. The application shall include the results of a pool water test conducted by an independent testing organization which shows a cyanuric acid level above 100 parts per million, total dissolved solids over 2,500 parts per million, or calcium over 450 parts per million, or stating the nature and duration of repairs to be made and the date on which the pool will be drained.

(6) Prohibition of the filling or refilling of swimming pools during peak hours of 5:00 a.m. to 8:00 a.m. and 5:00 p.m. to 8:00 p.m., except that a standard hose up to 3/4" may be used to fill the pool and keep the tile and plaster wet during these hours.

The Director shall propose fees and promulgate guidelines for the implementation of this subsection which shall include criterion and a procedure for approval of applications or for exemption by the Director.

(d) The provisions of this section are conditions of service. Each use of water by a customer that is inconsistent with the provisions of this section is an incident of water wastage. If a customer has an incident of water wastage, the customer shall be charged the fee as described herein. The fee that customers shall be charged for each incident of water wastage described in this section shall not exceed the reasonable cost of service related to water wastage enforcement and the cost of the estimated additional water used and/or wasted. Such amount shall be a proprietary charge to cover the estimated costs of staff enforcement of the water conservation rules. Such charge shall be as determined by the Council and designated in the Master Fee Schedule.

(1) Such charge shall be levied as follows:

(i) For the first incident of water wastage, the fee designated in the Master Fee Resolution shall be deferred for a period of two years conditioned upon the customer not having a fourth incident of water wastage within a two year period. If the customer does not have such fourth incident of water wastage within two years such deferral shall become permanent. However, such fee shall be due and owing by the customer if a fourth incident of water wastage occurs within two years.

(ii) The fee for the second incident of water wastage shall be deferred for customers who attend a course in water conservation. The deferral shall be conditioned upon the customer's successful completion of a water conservation course provided by the Department of Public Utilities and the customer not having a third incident of water wastage within a two year period. The deferred fee shall be collected if a third incident of water wastage occurs within a two year period.

(iii) The fee for the third incident of water wastage within a two year period shall be the fee designated in the Master Fee Resolution (plus any fee deferred from the second incident of water wastage. A customer shall have the option of submitting proof of implementation of retrofit measures of no less value than the fee imposed for such third incident of water wastage in lieu of that fee. Retrofit measures of a value less than that fee shall be credited toward payment of the fee.

(iv) The fee for the fourth incident of water wastage within a two year period shall include the amount as designated in the Master Fee Schedule together with all applicable amounts previously deferred as described above.

(2) If a customer has more than four incidents of water wastage within a two year period, the city may implement any or all of the following measures:

(i) Require the customer to get a landscape evaluation, lawn water audit, and water budget, as appropriate, in order to learn efficient water use. This work would be completed at the customer expense by landscape irrigation auditors certified by the Irrigation Association.

(ii) Require a customer to repair any defects in the watering system of such customers within fourteen days of notice by the city to repair.

(iii) Installation by the city of flow restrictors or termination of water service for exterior use.

(iv) Termination of all water service to a customer unless in the opinion of the Director such termination would result in an unreasonable risk to the health and safety of persons.

(v) Require that restoration of water service after termination be contingent on an agreement by the customer to adhere to the provisions of this section.

(e) The Director shall prepare and present a rationing plan to Council for approval. Such plan shall be adopted by resolution passed by Council. (Orig. Ord. 4481; Am. Ord. 6486, 1964; Am. Ord. 73-120, § 6, eff. 8-16-73; Am. Ord. 77-99, § 1, eff. 9-23-77; Am. Ord. 78-74, §§ 1, 2, eff. 5-26-78; Am. Ord. 80-115, § 149, eff. 8-8-80; Am. Ord. 89-48, §§ 1, 2, eff. 4-18-89; Am. Ord. 89-77, § 1, eff. 6-7-89; Am. Ord. 89-102, § 1, eff. 9-22-89; Am. Ord. 90-72, § 1, eff. 8-24-90; Am. Ord. 90-97, § 1, eff. 10-12-90; Am. Ord. 91-104, § 1, eff. 10-18-91; Am. Ord. 91-112, § 1, eff. 11-22-91; Am. Ord. 93-14, § 1, eff. 2-23-93; Am. Ord. 93-20, § 2, eff. 4-30-93).

**SEC. 6-522. WATER EFFICIENT LANDSCAPE STANDARDS.**

(a) Water used for irrigation shall be minimized to the amount needed to maintain adequate plant health and growth with a minimum of waste or over spray on adjoining areas.

(b) Operation of Efficient Irrigation Systems. All persons who have installed completely new replacement irrigation systems on existing residential units are required to file irrigation plans pursuant to the Code Section 12-306-N.23 and 24, and shall use the City of Fresno Monthly Lawn Watering Chart to determine lawn water times. Longer watering times are permitted provided it can be shown necessary by calculations based on the evapotranspiration rate and sprinkler precipitation rates. For persons who use the City of Fresno Monthly Lawn Watering Chart, each area of the lawn shall receive no more than the maximum number of minutes per week for any one area of lawn.

(c) Irrigation system operation shall comply with Code Section 6-520.

(d) The "water customer" shall modify watering duration and frequency schedules so that the sprinkler's application does not exceed the irrigated area's absorption rate and generate surface runoff.

(e) Maintenance. It is the owner's responsibility to maintain the irrigation system by checking, adjusting sprinklers, repairing or replacing defective equipment and modifying the watering times to ensure efficient use of water. The customer is responsible for any wastage of water which originates on the customer's property.

(f) Existing Irrigation Systems (Manual/Automatic). On resale of existing property, the new owner shall certify in writing prior to obtaining water service from the City of Fresno that:

(1) The irrigation system has been checked and that all broken or defective irrigation equipment has been repaired or replaced.

(2) That all the system's components are functioning properly.

(3) No leaks exist.

(g) Enforcement. If a person violates any of the provisions of this section the city may implement any or all of the following measures:

(1) Require a customer to get a landscape evaluation, lawn water audit, and water budget, as appropriate, in order to learn efficient water use. This work shall be completed at customer expense by Landscape Irrigation Auditors certified by the Irrigation Association.

(2) Require a customer to repair any defects in the watering system of such person within fourteen days of notice by the city to repair.

(3) Installation by the city of flow restrictors or termination of water service for exterior use.

(4) Termination of all water service to a customer unless in the opinion of the Director of Public Utilities such termination would result in an unreasonable risk to the health and safety of persons.

(5) Require that restoration of water service after termination be contingent on an agreement by the customer to adhere to the provisions of this section.

A. If a water customer objects to the previously mentioned enforcement measures the following appeal process may be used.

Step 1. The customer may call the Water Conservation Program in order to discuss the incident with the staff person who initiated the enforcement measures.

The staff person has no authority to rescind the enforcement measures. However, upon being contacted by the customer, the staff person shall gather the facts about the incident and explain them to the Water Conservation Program Supervisor, who may decide whether or not to rescind the enforcement measure.

Step 2. If the customer is not satisfied with the decision of the Water Conservation Program Supervisor, he/she may appeal to the Water Systems Manager who shall review such appeal and render a written decision within thirty days after such appeal.

Step 3. If the customer is not satisfied with the decision of the Water Systems Manager he/she may appeal to the Director of Public Utilities who shall review such appeal and render a written decision within thirty days after receiving such appeal.

Step 4. The customer may make a final appeal directly to the City Council if still not satisfied.

The appeal listed in step 2 above shall be filed in writing within thirty days of the date of the notice outlining the

enforcement measure. Each subsequent appeal shall be filed in writing within 30 days from the date of the written decision being appealed. (Added Ord. 94-86, § 3, eff. 10-21-94).

**SEC. 6-523. DEFINITIONS FOR WATER EFFICIENT LANDSCAPE STANDARDS.**

(a) Unless the particular provision or the context otherwise requires, the definitions and provisions contained in this section shall govern the construction, meaning, and application of words and phrases used in this article, and, except to the extent that a particular word or phrase is otherwise specifically defined in this section, the definitions and provisions contained in Article 3 of Chapter 1 of this Code shall also govern the construction, meaning, and application of words and phrases used in this article. The definition of each word or phrase shall constitute, to the extent applicable, the definition of each word or phrase which is derivative from it, or from which it is a derivative, as the case may be.

(b) "Absorption rate" or "infiltration rate" means the rate of water entry into the soil expressed as a depth of water per unit of time (inches per hour).

(c) "Air Inlet Valve" means a port open to the atmosphere which permits air to enter a backflow assembly under a no water flow condition. These air inlets are utilized in atmospheric and pressure type vacuum breakers.

(d) "Application rate" means the depth of water applied to a given area, usually measured in inches per hour.

(e) "Atmospheric vacuum breaker" means an assembly containing a float-check seat and an air inlet port. The flow of water into the body causes the float to close the air inlet port. When the flow of water stops the float falls and forms a check valve against backsiphonage and at the same time opens the air inlet port to allow air to enter and satisfy the vacuum.

(f) "Automatic controller" means a mechanical or solid state timer, capable of operating valve stations to set the days, hours and length of time of water application.

(g) "Backflow prevention device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

(h) "Check valve" means a valve located under a sprinkler head to hold water in the system so it minimizes drainage from the lower elevation sprinkler heads.

(i) "Chemical injection" means the act of automatically or manually adding chemicals (usually fertilizer) to the irrigation system where it mixes with water and is subsequently applied to the landscape.

(j) "City of Fresno Monthly Lawn Watering Chart" means the chart of approximate lawn watering time (in minutes per week) published by the City of Fresno.

(k) "Cool season turf" means Annual bluegrass, Perennial rye grass, Red fescue, Tall fescue and other turf that is not dormant in winter.

(l) "Cross connection control" means any unprotected actual or potential physical connection or arrangement of piping or fixtures between two otherwise separate piping systems one of which contains potable water and the other non-potable water. This would include any temporary connections, such as swing connections, removable sections, four way plug valves, spools, dummy section of pipe, swivel or change-over devices or sliding multiport tube.

(m) "Downstream" means in the direction of the flow of a stream.

(n) "Emitter" means drip irrigation fittings that deliver water slowly from the system to the soil.

(o) "Evapotranspiration rate" means the inches of water per day.

(p) "Evaporation rate" means the inches of water per day.

(q) "Flex riser" means flexible material that allows a sprinkler head to bend if struck and come back into alignment.

(r) "Infiltration rate" means the rate at which water is absorbed into the soil expressed as a depth of water in inches.

(s) "Irrigation system" means the water delivery pipelines that supply water from the water source to the valve or outlet and to the emitters or sprinklers from the valve. An automatic controller is part of all new irrigation systems. See Section 6-501(z).

(t) "Irrigation valve circuit" means a system composed of piping, valves, pumps, controllers and outlets to distribute water to lawns, trees, shrubs, plants and other landscape facilities.

(u) "Landscape area" means the parcel area, including the right-of-way area and any easements, less building pad(s), driveway(s) and parking areas. This includes planted areas, water bodies, and natural areas.

(v) "Landscape modification" means any change to a landscape on site or on the landscape plan.

(w) "Landscape plan" means a plan to scale of not less than one inch equals 40 feet which shall show the

location, size and variety of all plantings, water supply, contours and similar designations as the Director may require for sufficient clarity to indicate the nature and extent of the work proposed.

(x) "Micro irrigation" means sprinkler heads that put out less than 16 gallons of water per hour used.

(y) "Mulch" means any material such as leaves, bark, straw or other materials left loose and applied to the solid surface to reduce evaporation.

(z) "New development" means any development for which a Development Plan is filed upon or after the effective date of this ordinance.

(aa) "Overspray" means water which is delivered beyond the landscaped area, wetting pavements, walks, structures, or other non-landscaped areas.

(bb) "Pedestrian parkway" mean those median islands or pathways which are greater than eight feet wide and used as pedestrian pathways.

(cc) "Plumbing permits" means a form obtained at the public counter of the Development Department which allows for a fee, certain plumbing related modifications or installations to occur on a structure or to landscaping.

(dd) "Pop-up spray heads" means a water pressure activated head which pops up and sprays water through a nozzle.

(ee) "Precipitation rate" means the rate at which water is applied to the plants.

(ff) "Pressure vacuum breaker" means an assembly containing an independently operating loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with properly located resilient seating test cocks and tightly closing resilient seating shut-off valves located at each end of the assembly. The entire assembly shall meet the design and performance specifications as determined by a laboratory and field evaluation program resulting in an approval by a recognized testing agency for backflow prevention assemblies. To be approved, these assemblies must be readily accessible for in-line testing and maintenance. The assembly must be installed a minimum of 12 inches above the highest water outlet, i.e. sprinkler head or tank fill.

(gg) "Rain gauge" means a system which automatically shuts off the irrigation system when it rains.

(hh) "Reduced pressure backflow preventer" means an assembly of two independently acting approved check valves together with a hydraulically operating mechanically independent pressure relief valve located between the check valves and at the same time below the first check valve. The unit shall include properly located resilient seating test cocks and tightly closing resilient seating shut-off valves at each end of the assembly. The entire assembly shall meet the design and performance specifications as determined by a laboratory and a field evaluation program resulting in an approval by a recognized testing agency for backflow prevention assemblies. The assembly shall operate to prevention assemblies. The assembly shall operate to maintain the pressure in the zone between the two check valves at an acceptable level less than the pressure on the public water supply side of the assembly. At cessation of a normal flow the pressure between the two check valves shall be less than the pressure on the public watersupply side of the device. In case of leakage either of the check valves, the differential relief valve shall operate to maintain the reduced pressure in the zone between the check valves by discharging to the atmosphere. To be approved, these assemblies must be readily accessible for in-line testing and maintenance and be installed in a location where no part of the assembly will be submerged.

(ii) "Separately metered automatic irrigation system" means a system composed of pipes, valves, pumps, controllers and outlets to distribute water for landscape purposes. This system is not connected to the domestic water supply, but has a separate, metered, connection to the public water supply system.

(jj) "Shut off device" means a mechanical or electrically operated device used to terminate the flow of liquids in a piping system. These devices could be gate valves, ball valves, electrical solenoid valves, butterfly valves or globe valves.

(kk) "Slope irrigation" means applying water to vegetation on a slope.

(ll) "Soil moisture sensors" means a device which activate and deactivate irrigation valves watering shrubs and lawns.

(mm) "Sprinkler head" means a device which sprays water through a nozzle.

(nn) "Sprinkler precipitation rate" means the depth of water applied to a given area by an irrigation sprinkler, usually measured in inches per hour.

(oo) "Subsurface emitters" means a buried drip irrigation fittings that deliver water slowly from the system to the soil.

(pp) "Swing joint" means a series of elbows and nipples that allow the sprinkler to move and turn in any direction while maintaining grade.

(qq) "Turf" means a surface layer of earth containing grass with its roots.

(rr) "Turf allowance" means the amount or percentage of turn area permitted in relation to the entire landscaped area.

(ss) "Turf area" means the amount of turf included within a set of lines, specifically, the number of unit squares of turf equal in measure to the surface.

(tt) "Valve" means a device used to control the flow of water in the irrigation system.

(uu) "Warm season turf" means Bermuda grass, Hybrid Bermuda, Kikuyu grass, Seashore paspalum, St. Augustine grass, Zoysia grass and Buffalo grass and other turf that is dormant in winter.

(vv) "Water area" means that part of a landscape composed of water features such as pools, fountains and ponds.

(ww) "Water efficient practice" means the application of a method of landscaping which conserves the water.

(xx) "Watering zones" means a portion of the landscaped area having plants with similar water needs that are served by a valve or set of valves with the same schedule. A watering zone may be irrigated or non-irrigated. For example, a naturalized area planted with native vegetation that will not need supplemental irrigation once established is a non-irrigated watering zone. (Added Ord. 94-108, § 3, eff. 12-30-94).

## **APPENDIX G**

---

### **Annual Water Conservation Program Status Report**



### Water Supply & Reuse

Reporting Unit:  
**City of Fresno**

Year:  
**2006**

#### Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
Fresno Sole Source Aquifer	155739.61	Groundwater
San Joaquin River (Class 1)	39882.3	Local Watershed
Kings River (Class 2)	0	Local Watershed

**Total AF: 195621.91**

Reported as of 5/27/08

**Accounts & Water Use**

Reporting Unit Name:  
**City of Fresno**

Submitted to CUWCC  
**05/24/2008**

Year:  
**2006**

**Report Not Filed**

**BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers**

Reporting Unit:	BMP Form Status:	Year:
City of Fresno	100% Complete	2006

Report Not Filed

**BMP 02: Residential Plumbing Retrofit**

Reporting Unit:  
**City of Fresno**

BMP Form Status:  
**100% Complete**

Year:  
**2006**

**Report Not Filed**

**BMP 03: System Water Audits, Leak Detection and Repair**

Reporting Unit:  
City of Fresno

BMP Form Status:  
100% Complete

Year:  
2006

Report Not Filed

**BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing**

Reporting Unit:	BMP Form Status:	Year:
City of Fresno	100% Complete	2006

**Report Not Filed**



Factor	Incentives Issued	Financial Incentives	AWARDED
1. Greater than 8.5 but not exceeding 9.5 (1 point each)		\$ 0	
2. Greater than 6.0 but not exceeding 8.5 (2 points each)		\$ 0	
3. Less than or equal to 6.0 (3 points each)		\$ 0	

**Method Two: Agency earns 1 point for each HEW**

	Number of Financial Incentives Issued	Total Value of Water Agency Financial Incentives	POINTS AWARDED
4. Total HEWs installed			
<b>PAST CREDIT TOTALS:</b>		<b>\$ 0</b>	<b>0</b>

**D. Rebate Program Expenditures**

- 1. Average or Estimated Administration and Overhead \$ 0
- 2. Is the financial incentive offered per HEW at least equal to the marginal benefits of the water savings per HEW?

**E. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**F. Comments**

The City of Fresno will begin offering a washing machine rebate November 2007.

**BMP 07: Public Information Programs**

Reporting Unit:  
**City of Fresno**

BMP Form Status:  
**100% Complete**

Year:  
**2006**

**Report Not Filed**

Reported as of 5/27/08

**BMP 08: School Education Programs**

Reporting Unit: **City of Fresno**      BMP Form Status: **100% Complete**      Year: **2006**

Report Not Filed

**BMP 09: Conservation Programs for CII Accounts**

Reporting Unit: **City of Fresno**      BMP Form Status: **100% Complete**      Year: **2006**

**A. Implementation**

- 1. Has your agency identified and ranked COMMERCIAL customers according to use? yes
- 2. Has your agency identified and ranked INDUSTRIAL customers according to use? yes
- 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? yes

**Option A: CII Water Use Survey and Customer Incentives Program**

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? If so, please describe activity during reporting period: no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0
CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no
Agency CII Customer Incentives	Budget (\$/Year)	# Awarded to Customers	Total \$ Amount Awarded
h. Rebates	0	0	0

i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

**Option B: CII Conservation Program Targets**

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option? no

6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? no

7. **System Calculated** annual savings (AF/yr):

CII Programs	# Device Installations
a. Ultra Low Flush Toilets	0
b. Dual Flush Toilets	0
c. High Efficiency Toilets	0
d. High Efficiency Urinals	0
e. Non-Water Urinals	0
f. Commercial Clothes Washers (coin-op only; not industrial)	0
g. Cooling Tower Controllers	0
h. Food Steamers	0
i. Ice Machines	0
j. Pre-Rinse Spray Valves	0
k. Steam Sterilizer Retrofits	0
l. X-ray Film Processors	0

8. **Estimated** annual savings (AF/yr) from agency programs not including the devices listed in Option B. 7., above:

CII Programs	Annual Savings (AF/yr)
a. Site-verified actions taken by agency:	0
b. Non-site-verified actions taken by agency:	0

**B. Conservation Program Expenditures for CII Accounts**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

The City does not have a qualified staff position to coordinate this BMP.

## BMP 11: Conservation Pricing

Reporting Unit:  
City of Fresno

BMP Form  
Status:  
**100% Complete**

Year:  
**2006**

### A. Implementation

#### Water Service Rate Structure Data by Customer Class

Number of schedules:		Use of classification:
How many rate schedules does agency offer/use for...		This agency...
1. <b>Single-family residential</b> accounts?	2	Uses classification in its billing system
2. <b>Multi-family residential</b> accounts?	2	Uses classification in its billing system
3. <b>Commercial</b> accounts?	2	Uses classification in its billing system
4. <b>Industrial</b> accounts?	2	Uses classification in its billing system
5. <b>Institutional/ government</b> accounts?	2	Includes customers in another class
6. <b>Dedicated irrigation</b> (potable water) accounts?	1	Includes customers in another class
7. <b>Other</b> accounts?	0	Does not serve this type of customer
8. <b>Recycled-reclaimed water</b> accounts?	0	Does not serve this type of customer
9. <b>Raw water</b> (urban use) accounts?	0	Does not serve this type of customer
10. <b>Wholesale</b> (urban use) accounts?	0	Does not serve this type of customer

#### Sewer Service

- 11. Does your agency provide sewer service to your water customers? yes
- a. If yes, does sewer service use conservation rate structures? yes
- 12. Has your agency made the required efforts (as prescribed in BMP 11) to have sewer services billed on conservation rates? yes
- 13. What water agency activities have been undertaken during the reporting period to achieve waste water agency volumetric billing in your water agency service area? Ordinances

### B. "At Least As Effective As"

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### C. Comments

The City of Fresno Ordinances and Master Fee Schedule give direction for volumetric billing. The City of Fresno sewer service billing is based on potable consumption for the majority of commercial users and effluent metering for the majority of industrial users. Single and multi-family units are billed a flat rate.

**BMP 11: Conservation Pricing**

Reporting Unit:  
City of Fresno

BMP Form Status:  
100% Complete

Year:  
2006

**1.A. Single-Family Residential Rate Schedule A**

a. Water Rate Structure	Non-volumetric Flat Rate
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	197
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	21307132
e. Total Revenue from this category	21307329

**1.A. Rate Schedule - Volumetric**

Title: Water, Metered Service Rate

f. Billing Cycles/year	6	
g. Service Charges/Cycle	8.16	
h. Gallons/Bill Unit	748	
i. Minimum Use/Cycle	0	
j. Non-billed Units (included in monthly service charge)	0	
	<b>S/Bill Unit</b>	<b>Starting At (unit qty.)</b>
k. Tier 1	.606	HCU
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0
q. Approximate quantity of meters/accounts on this rate schedule		1
r. Are elevation charges included?		no
s. Approximate total annual water usage (AF) from customers on this rate schedule		.34

**1.B. Single-Family Residential Rate Schedule B**

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from only Volumetric Charges	0
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	0

e. Total Revenue from this category 0

**1.B. Rate Schedule - Volumetric**

Title: none

f. Billing Cycles/year 0

g. Service Charges/Cycle 0

h. Gallons/Bill Unit 0

i. Minimum Use/Cycle 0

j. Non-billed Units (included in monthly service charge) 0

	\$/Bill Unit	Starting At (unit qty.)
k. Tier 1	0	0
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0

q. Approximate quantity of meters/accounts on this rate schedule 0

r. Are elevation charges included? no

s. Approximate total annual water usage (AF) from customers on this rate schedule 0

**BMP 11: Conservation Pricing**

Reporting Unit:  
City of Fresno

BMP Form Status:  
100% Complete

Year:  
2006

**2.A. Multi-Family Residential Rate Schedule A**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform Seasonal
c. Total Revenue from only Volumetric Charges	4266361
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	1355948
e. Total Revenue from this category	5622309

**2.A. Rate Schedule - Volumetric**

Title: Water, Metered Service Rate

f. Billing Cycles/year 6

g. Service Charges/Cycle 8.16

h. Gallons/Bill Unit 748

i. Minimum Use/Cycle		0
j. Non-billed Units (included in monthly service charge)		0
	<b>S/Bill Unit</b>	<b>Starting At (unit qty.)</b>
k. Tier 1	.606	HCU
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0
q. Approximate quantity of meters/accounts on this rate schedule		7516
r. Are elevation charges included?		no
s. Approximate total annual water usage (AF) from customers on this rate schedule		22467

**2.B. Multi-Family Residential Rate Schedule B**

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from only Volumetric Charges	0
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	0
e. Total Revenue from this category	0

**2.B. Rate Schedule - Volumetric**

Title: none

f. Billing Cycles/year	0
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	0
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	<b>S/Bill Unit</b>	<b>Starting At (unit qty.)</b>
k. Tier 1	0	0
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0

q. Approximate quantity of meters/accounts	0
--	---

on this rate schedule  
 r. Are elevation charges included? no  
 s. Approximate total annual water usage (AF) from customers on this rate schedule 0

**BMP 11: Conservation Pricing**

Reporting Unit: **City of Fresno**      BMP Form Status: **100% Complete**      Year: **2006**

**3.A. Commercial Rate Schedule A**

a. Water Rate Structure Uniform  
 b. Sewer Rate Structure Uniform  
 c. Total Revenue from only Volumetric Charges 3817593  
 d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.) 2675310  
 e. Total Revenue from this category 6492903

**3.A. Rate Schedule - Volumetric**

Title: Water, Commercial Meter

f. Billing Cycles/year 6  
 g. Service Charges/Cycle 8.16  
 h. Gallons/Bill Unit 748  
 i. Minimum Use/Cycle 0  
 j. Non-billed Units (included in monthly service charge) 0

	S/Bill Unit	Starting At (unit qty.)
k. Tier 1	.607	HCU
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0

q. Approximate quantity of meters/accounts on this rate schedule 7589  
 r. Are elevation charges included? no  
 s. Approximate total annual water usage (AF) from customers on this rate schedule 20033

**3.B. Commercial Rate Schedule B**

a. Water Rate Structure Service Not Provided  
 b. Sewer Rate Structure Service Not Provided  
 c. Total Revenue from only Volumetric

Charges		0
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)		0
e. Total Revenue from this category		0
<b>3.B. Rate Schedule - Volumetric</b>		
Title: none		
f. Billing Cycles/year		0
g. Service Charges/Cycle		0
h. Gallons/Bill Unit		0
i. Minimum Use/Cycle		0
j. Non-billed Units (included in monthly service charge)		0
	<b>\$/Bill Unit</b>	<b>Starting At (unit qty.)</b>
k. Tier 1	0	0
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0
q. Approximate quantity of meters/accounts on this rate schedule		0
r. Are elevation charges included?		no
s. Approximate total annual water usage (AF) from customers on this rate schedule		0

**BMP 11: Conservation Pricing**

Reporting Unit: **City of Fresno**      BMP Form Status: **100% Complete**      Year: **2006**

**4.A. Industrial Rate Schedule A**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from only Volumetric Charges	732841
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	72663
e. Total Revenue from this category	805504

**4.A. Rate Schedule - Volumetric**

Title: Industrial Commercial Water Rates

f. Billing Cycles/year	6
g. Service Charges/Cycle	8.16
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	\$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.606	HCU
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0

q. Approximate quantity of meters/accounts on this rate schedule	95
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	3.864

**4.B. Industrial Rate Schedule B**

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from only Volumetric Charges	0
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	0
e. Total Revenue from this category	0

**4.B. Rate Schedule - Volumetric**

Title: none

f. Billing Cycles/year	0
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	0
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	\$/Bill Unit	Starting At (unit qty.)
k. Tier 1	0	0
l. Tier 2	0	0
m. Tier 3	0	0

n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0
q. Approximate quantity of meters/accounts on this rate schedule		0
r. Are elevation charges included?		no
s. Approximate total annual water usage (AF) from customers on this rate schedule		0

**BMP 11: Conservation Pricing**

Reporting Unit: **City of Fresno**      BMP Form Status: **100% Complete**      Year: **2006**

**5.A. Institutional Rate Schedule A**

a. Water Rate Structure		Uniform
b. Sewer Rate Structure		Uniform
c. Total Revenue from only Volumetric Charges		1052478
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)		477033
e. Total Revenue from this category		1529511

**5.A. Rate Schedule - Volumetric**

Title: Water Rates Institutional

f. Billing Cycles/year		6
g. Service Charges/Cycle		8.16
h. Gallons/Bill Unit		748
i. Minimum Use/Cycle		0
j. Non-billed Units (included in monthly service charge)		0

	\$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.606	HCU
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0

q. Approximate quantity of meters/accounts on this rate schedule		375
r. Are elevation charges included?		no
s. Approximate total annual water usage (AF)		

from customers on this rate schedule 5542

**5.B.. Institutional Rate Schedule B**

- a. Water Rate Structure Service Not Provided
- b. Sewer Rate Structure Service Not Provided
- c. Total Revenue from only Volumetric Charges 0
- d. Total Revenue from Non-Volumetric Charges  
(Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.) 0
- e. Total Revenue from this category 0

**5.B. Rate Schedule - Volumetric**

Title: none

- f. Billing Cycles/year 0
- g. Service Charges/Cycle 0
- h. Gallons/Bill Unit 0
- i. Minimum Use/Cycle 0
- j. Non-billed Units (included in monthly service charge) 0

	\$/Bill Unit	Starting At (unit qty.)
k. Tier 1	0	0
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0
q. Approximate quantity of meters/accounts on this rate schedule		0
r. Are elevation charges included?		no
s. Approximate total annual water usage (AF) from customers on this rate schedule		0

**BMP 11: Conservation Pricing**

Reporting Unit: **City of Fresno**      BMP Form Status: **100% Complete**      Year: **2006**

**6.A. Irrigation Rate Schedule A**

- a. Water Rate Structure Uniform
- b. Sewer Rate Structure Uniform
- c. Total Revenue from only Volumetric Charges 1380714
- d. Total Revenue from Non-Volumetric Charges  
(Includes fixed fees, surcharges, minimum usage charges, monthly service charges, 378773

meter charges etc.)  
 e. Total Revenue from this category 1759487

**6.A. Rate Schedule - Volumetric**

Title: Water Rates Dedication Irrigation

f. Billing Cycles/year 6  
 g. Service Charges/Cycle 8.16  
 h. Gallons/Bill Unit 748  
 i. Minimum Use/Cycle 0  
 j. Non-billed Units (included in monthly service charge) 0

	\$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.606	HCU
l. Tier 2	0	0
m. Tier 3	0	0
n. Tier 4	0	0
o. Tier 5	0	0
p. Tier 6	0	0

q. Approximate quantity of meters/accounts on this rate schedule 2345  
 r. Are elevation charges included? no  
 s. Approximate total annual water usage (AF) from customers on this rate schedule 7513

**BMP 12: Conservation Coordinator**

Reporting Unit: City of Fresno      BMP Form Status: 100% Complete      Year: 2006

**A. Implementation**

- 1. Does your Agency have a conservation coordinator? yes
- 2. Is a coordinator position supplied by another agency with which you cooperate in a regional conservation program ? no
  - a. Partner agency's name:
- 3. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position? 80%
  - b. Coordinator's Name Nora Laikam
  - c. Coordinator's Title Water Conservation Supervisor
  - d. Coordinator's Experience and Number of Years 2 years
  - e. Date Coordinator's position was created (mm/dd/yyyy) 08/01/1988

4. Number of conservation staff (FTEs), including Conservation Coordinator. 5

**B. Conservation Staff Program Expenditures**

1. Staffing Expenditures (In-house Only) 368731.44  
 2. BMP Program Implementation Expenditures 303644.37

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no  
 a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

**BMP 13: Water Waste Prohibition**

Reporting Unit: City of Fresno      BMP Form Status: 100% Complete      Year: 2006

**A. Requirements for Documenting BMP Implementation**

1. Is a water waste prohibition ordinance in effect in your service area? yes  
 a. If YES, describe the ordinance:  
 City of Fresno Municipal Code, Chapter 14 Water, Article 1 Water Regulations, Section 14-119 Wastage of Water. Prohibits water waste and provides guidelines to regulate.  
 2. Is a copy of the most current ordinance(s) on file with CUWCC? yes  
 a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:  
 City of Fresno      3,304

**B. Implementation**

1. Indicate which of the water uses listed below are prohibited by your agency or service area.  
 a. Gutter flooding yes  
 b. Single-pass cooling systems for new connections yes  
 c. Non-recirculating systems in all new conveyor or car wash systems no  
 d. Non-recirculating systems in all new commercial laundry systems no  
 e. Non-recirculating systems in all new decorative fountains no  
 f. Other, please name no

2. Describe measures that prohibit water uses listed above:  
 Field representatives monitor for water waste and enforce regulations, including prohibition of flooding gutters.

**Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:

- a. Allow the sale of more efficient, demand-initiated regenerating DIR models. no
- b. Develop minimum appliance efficiency standards that:
  - i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. no
  - ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no
- c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no
- 4. Does your agency include water softener checks in home water audit programs? no
- 5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

The City Wastewater Division has a representative on the State Water Resources Control Board Central Valley Salinity Policy Committee established to develop regional salinity policy for water quality issues. The City Wastewater Division began a media campaign to communicate with the residents about the impact of salt to the Fresno area. This included radio, tv, newspaper, brochures, and billing inserts. A "Salt is Serious" brochure listing negative effects of water softeners is left with the customer during interior surveys. The second phase of the media campaign will address water softeners and other water treatment systems in more detail. FAQ's have been added to the City Wastewater webpage.

**BMP 14: Residential ULFT Replacement Programs**

Reporting Unit: **City of Fresno**      BMP Form Status: **100% Complete**      Year: **2006**

**A. Implementation**

Number of 1.6 gpf Toilets Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Rebate	253	10
3. Direct Install	0	0
4. CBO Distribution	0	0

5. Other	0	0
<b>Total</b>	<b>253</b>	<b>10</b>

**Number of 1.2 gpf High-Efficiency Toilets (HETs) Replaced by Agency Program During Report Year**

	Single-Family Accounts	Multi-Family Units
6. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
7. Rebate	0	0
8. Direct Install	0	0
9. CBO Distribution	0	0
10. Other	0	0
<b>Total</b>	<b>0</b>	<b>0</b>

**Number of Dual-Flush Toilets Replaced by Agency Program During Report Year**

	Single-Family Accounts	Multi-Family Units
11. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
12. Rebate	0	0
13. Direct Install	0	0
14. CBO Distribution	0	0
15. Other	0	0
<b>Total</b>	<b>0</b>	<b>0</b>

16. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for single-family residences.

The City of Fresno offers a \$75 rebate for replacing existing high-water-using toilets with ULFT (1.6 gallons or less) in single-family and multi-family residences - - up to 3 rebates per customer account. The program is marketed through mailings, retailer, flyers, media, and outreach events.

17. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for multi-family residences.

The City of Fresno offers a \$75 rebate for replacing existing high-water-using toilets with ULFT (1.6 gallons or less) in single-family and multi-family residences - - up to 3 rebates per customer account. The program is marketed through mailings, retailer, flyers, media, and outreach events.

18. Is a toilet retrofit on resale ordinance in effect for your service area? no

19. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

**B. Residential ULFT Program Expenditures**

1. Estimated cost per ULFT/HET replacement: 248

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

## **APPENDIX H**

---

### **Water Conservation Plan BMPs**



## City of Fresno Water Conservation Plan (May 2005) Section 4: BMPs for Urban Water Suppliers

*(This section is taken verbatim from the California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding (MOU), March 14, 2003.)*

### *1. Water Survey Programs for Single-Family and Multi-Family Residential Customers*

*The program includes the following actions:*

- a. Contact via letter or telephone single-family and multi-family residential customers.
- b. Provide surveys to single-family and multi-family unit residential customers.
- c. Instruct customers in meter reading.
- d. Check for leaks, including toilets/faucets and, if necessary, provide toilet flappers/faucet washers.
- e. Check showerhead and aerator flow rates, and provide low-flow models, as necessary.
- f. Check toilet flow rates, and when appropriate, recommend a ultra-low flow toilet (ULFT) replacement.
- g. Check irrigation system for leaks/overlap and determine timer functioning and current schedule.
- h. Measure landscaped area and develop irrigation schedule.
- i. Provide customer with evaluation results, water saving recommendations, and other information.

*The City will annually collect and submit the following information:*

- a. Number of single-family and multi-family residential accounts in service area.
- b. Number of single-family residential surveys offered during reporting period.
- c. Number of single-family residential surveys completed during reporting period.
- d. Number of multi-family residential surveys offered during reporting period.
- e. Number of multi-family residential surveys completed during reporting period.
- f. Monitor annual water-use changes in consumption at surveyed accounts, individually and as a group.

The City currently performs few single-family or multi-family *interior* water surveys. However, if a request for interior survey is received, staff is available to respond. There has been little interest in this service by single-family consumers probably because of low, flat-rate water charges. Multi-family also has shown little interest.

The City has not aggressively marketed single-family or multi-family *interior* water surveys. It does, however, aggressively market and perform single-family and multi-family *exterior* water surveys which has the highest water usage. The program is marketed through media, billing inserts, promotional materials, public outreach events, speaker's bureau and the City's web site.

The City will develop a program and train staff to provide interior water survey to customers as part of a pilot program to begin by July 1, 2006. Results will be monitored by recording and reporting number of audits completed. The City will target 25 percent of the annual target for multi-family accounts in this first pilot study. A single-family pilot study will start in 2008. Upon implementation of the pilot program, the City will notify customers of its water survey program by enhancing its present marketing approach to include both interior and exterior water surveys.

The City has begun discussion and investigations on how it will plan and conduct the pilot program. The City will contact the California Urban Water Council for assistance to help set up the pilot program. The City will also ask USBR to review its pilot study plan.

The City does, however, perform a number of *exterior* landscape surveys, and collects information about the surveys. Improvement is needed to better format this material for reporting purposes. This program is staffed with two permanent Landscape Water Conservation Representatives. Surveys are offered and cost-effective measures recommended. The City primarily reaches its customers through advertising in billing inserts, conservation literature, speakers bureau, tours, web site, public outreach events.

During the exterior survey, City staff provides the following services:

- Landscape water-use surveys include consultation, irrigation system efficiency rating using catch can distribution uniformity method, measurement of turf and other landscape area.
- Controller setting and water budgeting recommendations. Landscape consultations to include controller settings and operation, landscape design assistance, irrigation system upgrade and design advice, plant selection and cost estimates.

To further enhance the exterior landscape program, staff has proposed in the FY'06 budget that the City begin a pilot program in offering rebates to rate payers to purchase updated and more efficient automatic irrigation timers.

The program is marketed through media, billing inserts, promotional materials, public outreach events, speaker's bureau, and the City's web site. Upon implementation of the pilot program, the City will notify customers of its water survey program by including both interior and exterior water surveys.

See Attachment 1 – Customer Communication: Examples of communication opportunities and promotional materials currently used or available marketing programs for all BMP's.

The City has begun discussions and investigations on how it will plan and conduct the pilot program to cover both interior and exterior surveys. The City will contact the California Urban Water Council for assistance to help set up the pilot program. The City will also ask USBR to review its pilot study plan.

See Attachment 2 – Pilot Project Implementation Schedule and Budget Estimates.

## 2. Residential Plumbing Retrofit

*The program includes the following actions:*

- a. Retrofit kits will consist of high-quality, 2.5 gpm or less showerheads and 2.2 gpm or less faucet aerators.
- b. Distribution to not less than 10 percent of single-family and 10 percent of multi-family units each year, until 75 percent of single-family and 75 percent of multi-family units are retrofitted.
- c. Track the location, type and number of retrofits completed, devices distributed, and program costs.

*The City will annually collect and submit the following information:*

- a. The total number of non-retrofitted pre-1992 single-family residences and multi-family units.
- b. The number of retrofit kits distributed and installed during previous reporting period.
- c. The estimated percentage of pre-1992 single-family residences and multi-family units in service area fitted with low-flow showerheads and faucet aerators.

Free low flow shower heads and faucet aerators are available to City rate payers. These items are distributed based on consumer request and also during public outreach events. Recently, fewer requests for showerheads are being received from customers. This is due to the efficiency standards requiring that only low flow showerheads be sold in this country. Since 1993 the City has provided more than 120,000 showerheads to pre-1992 homes and currently more than 75% of pre-1992 homes have efficient showerheads. This BMP is complete.

The City will continue distributing free low flow shower heads and faucet aerators.

### 3. *System Water Audits, Leak Detection, and Repair*

*The program includes the following actions:*

- a. Annually complete a prescreening system audit to determine the need for a full-scale system audit. The prescreening system audit is calculated as follows:
  - 1) Determine metered sales.
  - 2) Determine other system verifiable uses.
  - 3) Determine total supply into system.
  - 4) 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.
- b. When indicated, the City will complete a water audit of its distribution system using methodology consistent with that described in the American Water Works Association's (AWWA) Water Audit and Leak Detection Guidebook.
- c. The City also advises customers whenever it appears possible that leaks exist on the customer's side of the meter, performs distribution system leak detection when warranted and cost effective, and repairs leaks when found.

*The City will annually collect and submit the following information:*

- a. Prescreening audit results and supporting documentation.
- b. Maintain in-house records of audit results, or the completed AWWA audit worksheets for each completed audit period.

Water distribution data is compiled and compared. In 1998, approximately 60 miles of water mains were tested through a pilot detection program. At that time, few leaks were found. Staff is available to timely repair all reported leaks.

The City is currently reviewing new leak detection technology. A limited study was conducted in 2004 in a small area of an older section of Fresno with Permalog. No leaks were detected at that time. A full system audit will be conducted as soon as the City is fully metered. Older neighbors will be a priority. Increase in the priority of leak detection will be prioritized with the onset of the meter installation program begins 2008 and will be completed by 2013.

*4. Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections (NOT EXEMPTIBLE)*

*The program includes the following actions:*

- a. Install meters at new connections before those connections receive water.
- b. Install meters at existing unmetered connections at a consistent rate so all unmetered connections will be metered within the specified time stated in your contract.
- c. Bill all metered connections based on commodity rates.
- d. Conduct a study to identify any barriers or disincentives to retrofitting mixed-use commercial, industrial, and institutional (CII) accounts with dedicated landscape meters and assess the merits of a program to provide incentives to switch mixed-use CII accounts to dedicated landscape meters.

*The City will annually collect and submit the following information:*

- a. Confirmation that all new connections are metered and are being billed by volume of use.
- b. Total number of unmetered connections and number of previously unmetered connections which were metered during 1998 and 1999.
- c. Number of CII accounts with mixed-use meters.
- d. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.
- e. Impact of subsidized rates on water use.

The City currently installs, reads and bills commercial, industrial, institutional and multi-family meters. Regulations required all new houses have meters beginning Jan 1, 1992. The City has installed meters on all homes built since that time.

In compliance with AB2572, the city has an installation program and schedule in place to install meters on all existing customer properties currently without meters, and meter rates charged on or before 2013. Meter retrofit installations will begin about 2008.

See Attachment 3 City Meter Installation Plan Metering Plan referred to as Exhibit C in the Long-Term Renewal Contract Between the United States and City of Fresno (Contract No. 14-06-200-8901-LTR1).

## 5. Large Landscape Conservation Programs and Incentives

*The program includes the following components:*

### *Customer Support, Education, and Assistance*

Provide non-residential customers with support and incentives to improve their landscape water-use efficiency. This program will provide:

#### *Accounts with Dedicated Irrigation Meters*

- a. The landscaped area at accounts with dedicated irrigation meters will be measured and ETo-based water-use budgets equal to no more than 100 percent of reference ET per square foot of landscape area will be assigned to each account.
- b. Notices will be provided each billing cycle to accounts with water-use budgets showing the relationship between the budget and the actual consumption.

#### *Mixed-Use Meters or Not Metered*

- a. Mixed-use CII accounts with landscaping will be identified.
- b. A strategy targeting and marketing large landscape water-use surveys to accounts with mixed-use meters will be developed.
- c. Cost-effective measures will be identified and offered, such as:
  - 1) Landscape water-use analysis/survey.
  - 2) Voluntary water-use budgets.
  - 3) Installation of dedicated landscape meters.
  - 4) Training (multi-lingual, where appropriate) in landscape maintenance, irrigation system maintenance, and irrigation system design.
  - 5) Financial incentives to improve irrigation system efficiency such as loans, rebates, and grants for the purchase and/or installation of water-efficient irrigation systems.
  - 6) Follow up water-use analyses/surveys with a letter, phone call, or site visit, where appropriate.
- d. Survey elements will include: Measurement of landscape area; measurement of total irrigable area; irrigation system check and distribution uniformity analysis; review or develop irrigation schedules, as appropriate; and provision of a customer survey report and information packet.

#### *New or Change of Service Accounts*

New customers and change-of-service CII customer accounts will be provided information on climate-appropriate landscape design and efficient irrigation equipment/-management.

*The City will annually collect and submit the following information:*

#### *Dedicated Landscape Irrigation Accounts*

- a. Number of dedicated irrigation meter accounts.
- b. Number of dedicated irrigation meter accounts with water budgets.
- c. Aggregate water use for dedicated landscape accounts with budgets.
- d. Aggregate budgeted water use for dedicated landscape accounts with budgets.

#### *Mixed-Use Accounts*

- a. Number of mixed-use accounts.
- b. Number, type, and dollar value of incentives, rebates, and no- or low-interest loans offered to, and received by, customers.

- c. Number of surveys offered.
- d. Number of surveys accepted.
- e. Estimated annual water savings by customers receiving surveys and implementing recommendations.

The City has a Large Landscape Conservation Program which is staffed with two permanent Landscape Water Conservation Representatives, and available to the consumer. Surveys are offered and cost-effective measures recommended. The City primarily reaches its customers through advertising in billing inserts, conservation literature, speakers bureau, tours, web site, public outreach events. The City does have the ability to collect survey information for large landscapes. The City is currently survey landscape meter accounts to identify which serve one acre or more of landscape. The identified large accounts will receive water budgets over four years, beginning 2006.

#### Mixed Use Meters

- a. Identify mixed-use CII accounts with landscaping  
(Commercial Industrial survey records)
- b. Mixed –use water-use surveys are targeted and monitored primarily through the City’s customer water use database system. Large turf areas account for higher water use in most of the City’s mixed use accounts.  
Marketing includes personal contact with prospective property owners after visual survey of the grounds. In the case of commercial properties with landscape features an interior survey is also offered.
- c. Cost-effective measures offered:
  - 1. Landscape water-use surveys include consultation, irrigation system efficiency rating using catch can distribution uniformity method, measurement of turf and other landscape area.
  - 2. Controller setting and water budgeting recommendations.
  - 3. Follow-up contact annually.
  - 4. Offer of sub-meter installation for landscape (property owner expense)
  - 5. Landscape consultations to include controller settings and operation, landscape design assistance, irrigation system upgrade and design advice, plant selection and cost estimates.

To further enhance the exterior landscape program, staff has proposed in the FY’06 budget that the City begin a pilot program in offering rebates to rate payers to purchase updated and more efficient automatic irrigation timers.

The program is marketed through media, billing inserts, promotional materials, public outreach events, speaker’s bureau, and the City’s web site. Upon implementation of the pilot program, the City will notify customers of its water survey program by including both interior and exterior water surveys.

See Attachment 1 – Customer Communication: Examples of communication opportunities and promotional materials currently used or available marketing programs for all BMP’s.

## 6. High-Efficiency Washing Machine Rebate Programs

*The program includes the following components:*

- a. Determination of whether local energy providers have a high-efficiency washing machine rebate program. Determination of cost-effective rebate amount.
- b. If cost-effective rebate is \$50 or more, establishment of a cooperative rebate program with energy providers.
- c. If cost-effective rebate is less than \$50, or local energy providers do not have a high-efficiency washing machine rebate program, information on high-efficiency washing machines (and, if appropriate, local energy provider rebate program) will be provided to customers
- d. Support for local, State, and Federal legislation to improve efficiency standards for washing machines.

*The City will annually collect and submit the following information:*

- a. Customer incentives to purchase high-efficiency washing machines being offered by local energy service providers, if any.
- b. Data to determine the amount of a high-efficiency washing machine incentive that would be cost effective for the City to provide its customers.

The Water Division does not currently have a formal high-efficiency washing Machine rebate program. The City has contacted PG&E and they do have a 2005 rebate program of \$35 to \$75. For a \$35 rebate (Level 1), the clothes washer must have a Modified Energy Factor (MEF) of 1.42-1.59 and a Water Factor (WF) of 9.5 or lower. For a \$75 rebate (Level 2), the clothes washer must have a MEF of 1.60 or greater and a WF of 8.5 or lower.

The City's current meter water rates are \$.616 per 1000 gallons of water used. An individual rate payer washing two loads per week in a 50 gallon per load standard top loading washing machine, will use approximately 5,200 gallons per year at a cost of approximately \$3.20 per year for water used. Incentives to purchase high-efficiency washing machines based on water cost savings may not be effective at this time. Water rates are currently under study by the City.

The City also participates in the Flex Your Power (FYP) program. A letter of support for the FYP program was sent by the City at the request of the California Urban Water Council. In April 2004, the California Water Awareness Campaign and the Flex Your Power energy efficiency program joined together to promote water and energy efficient appliances. Centered around Earth Day, over 40 water agencies, including the City of Fresno, participated in the project by choosing local non-profit organizations to receive new ENERGY STAR clothes washers and dryers

The City has begun discussions and investigations on how it will plan and conduct the pilot program. The City will contact the California Urban Water Council for assistance to help set up the pilot program. The City will also ask USBR to review its pilot study plan.

See Attachment 4 – Exempt Analysis. Spreadsheet showing high-efficiency savings under current City rate structure.

## 7. Public Information Programs

*The program includes the following components:*

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 in gallons per day for the last billing period compared to the same period the year before; providing public information to promote water conservation practices; and coordinating with other government agencies, industry groups, public interest groups, and the media.

*The City will annually collect and submit the following information:*

- a. Number of public speaking events relating to conservation during reporting period.
- b. Number of media events relating to conservation during reporting period.
- c. Number of paid or public service announcements relating to conservation produced or sponsored during reporting period.
- d. Types of information relating to conservation provided to customers.
- e. Annual budget for public information programs directly related to conservation.

The Water Division's public information program is managed in-house with the assistance of a contracted public relations firm. The firm's services include strategic planning, creative concepts, public relations, marketing, promotion, research, advertising, media placement, production and design, copy writing, event production and marketing and online services.

The City's public information program has many components including multi-media campaigns (paid and public service advertising); customer billing inserts; literature; public outreach activities, speakers bureau and inter-agency partnerships. Hmong and Spanish language is also utilized as is possible.

The City participates in *Water Awareness Month* activities through its affiliation with the Central Valley Water Awareness Committee, comprised of a number of public agencies and private companies.

The Water Division has informally kept records of these related activities. Beginning in the Year 2005, the Division will keep formal and accurate records of these activities for submittal. The annual budget for public information and education program budget is approximately \$200,000.

See Attachment 1 – Customer Communication: Examples of communication opportunities and promotional materials currently used or available marketing programs for all BMP's.

## 8. School Education Programs

*The program includes the following components:*

Working with public 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. Education materials shall meet the State education framework requirements and grade-appropriate materials shall be distributed to grade levels K-3, 4-6, 7-8, and high school.

The City will annually collect and submit the following information:

- a. Number of school presentations made during reporting period.
- b. Number and type of curriculum materials developed and/or provided by water supplier, including confirmation that curriculum materials meet State education framework requirements and are grade-level appropriate.
- c. Number of students reached.
- d. Number of in-service presentations or teacher's workshops conducted during reporting period.
- e. Annual budget for school education programs related to conservation.

The City works with schools in the Fresno customer service area through its School Education Program. The Water Education Education Coordinator is a certified teacher on contract, who has developed the program and is available for presentations to students, teachers and community groups. Some education data is recorded.

Information for 2003-2004 follows:

- Number of school presentations made during reporting period: 23 Presentations
- Number and type of curriculum materials developed and/or provided by water supplier, including confirmation that curriculum materials meet State education framework requirements and are grade-level appropriate.

See Attachment 5 – School Education Curriculum and Materials FY 2004.

- Number of students reached: 659 Students
- Number of in-service presentations or teacher's workshops conducted during reporting period: One teacher workshop
- Annual budget for school education programs related to conservation: Contract salary plus other program expenses, \$50,546.81.

The program is marketed through media, billing inserts, promotional materials, public outreach events, speaker's bureau, and the City's web site. Upon implementation of the pilot program, the City will notify customers of its water survey program by including both interior and exterior water surveys.

See Attachment 1 – Customer Communication: Examples of communication opportunities and promotional materials currently used or available marketing programs for all BMP's.

## 9. Conservation Programs for CII Accounts

*The program includes the following components:*

- a. Identify CII customers by standard industrial classification (SIC) codes.
- b. Rank CII customers according to annual water use.
- c. Provide audits to the targeted number of CII accounts.
- d. Replace the targeted number of high-water-using toilets with ULFTs.
- e. Monitor the effectiveness of implemented audit recommendations.
- f. Identify incentives programs, which would encourage the implementation of cost-effective audit recommendations that were not implemented.

*The City will annually collect and submit the following information:*

- a. The number of customers and amount of water use within the CII customer classes.
- b. Number of CII customers offered a survey during the year.
- c. Number of CII surveys completed during the year.
- d. Number of follow-up audits completed during the year
- e. The type and number of water saving recommendations implemented.
- f. Incentive program budget and customer outlays.

The City currently has an Industrial/Commercial Water Conservation Representative Position, but it is vacant.

While the City does not aggressively market this service to its customers, should a request for survey be received, alternate staff is available to respond. Customers are notified of the availability of this program public outreach events, literature, speaker's bureau, and the City's web site. The City does identify customers according to classification and does rank the highest water users. A pilot program to determine the best implementation design for this BMP will be conducted in 2006.

See Attachment 1 – Customer Communication: Examples of communication opportunities and promotional materials currently used or available marketing programs for all BMP's.

The City has begun discussions and investigations on how it will plan and conduct the pilot program. The City will contact the California Urban Water Council for assistance to help set up the pilot program. The City will also ask USBR to review its pilot study plan.

See Attachment 6 – Pilot Project Implementation Schedule and Budget Estimates, CII Accounts.

## 10. Wholesale Agency Assistance Programs

The City is a retail water provider and exempt from BMP#10.

## 11. Conservation Pricing

*The program includes the following components:*

- a. Eliminating non-conserving pricing.
- b. Adopting conserving pricing.
- c. If City supplies both water and sewer service, this BMP applies to pricing of both water and sewer service.
- d. If City does not provide sewer service, it shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service.
- e. The City's next rate study will include consideration of incentive-rate structures for all customer types: Seasonal rates; increasing block rates; connection fee discounts; grant or loan programs to help finance conservation projects; financial incentives to change landscapes; variable hook-up fees tied to landscaping; and interruptible water service to large industrial, commercial, or public customers.

*The City will annually collect and submit the following information:*

- a. Report annual revenue generated by customer class for the reporting period.
- b. Report annual revenue derived from commodity charges by customer class for the reporting period.
- c. Report rate structure by customer class for water service and sewer service, if provided.

Metered water customers (Multi-family, Commercial, Industrial, Municipal, Schools, and Irrigation), are billed a stand-by fee and water consumption per thousand gallons. The City converted from a declining block rate to a uniform rate for metered customers in the mid 1980's. Fixed costs for currently metered customers are included in standby charges.

Single Family Residential water users are billed bi-monthly on a flat rate by property size. Quantity based pricing for singly family residential accounts will be developed by 2007 per the USBR Water Contract.

See Appendix G: Master Fee Schedule, Public Utilities Department – Water Rates pages 132 through 137.

With City Council authorization, the City will conduct a rate study to provide a meter rate structure for all customers, including residential services.

The City has begun discussions and investigations on how it will plan and conduct the pilot program. The City will contact the California Urban Water Council for assistance to help set up the pilot program. The City will also ask USBR to review its pilot study plan.

See Attachment 7 – BMP#11 Pilot Project Implementation Schedule and Budget Estimates for Conservation Pricing.

12. Conservation Coordinator

*The program includes the following components:*

- a. Designation of a water conservation coordinator and support staff (if necessary), whose duties shall include the following:
  - 1) Coordination and oversight of conservation programs and BMP implementation.
  - 2) Preparation and submittal of Reclamation's Annual Update (CUWCC BMP Implementation Report).
  - 3) Communication and promotion of water conservation issues to agency senior management; coordination of agency conservation programs with operations and planning staff; and preparation of annual conservation budget.

*The City will annually collect and submit the following information:*

- a. Water conservation coordinator name, staff position, and years on job.
- b. Number of water conservation coordinator staff.
- c. Duties of water conservation coordinator and staff.

The City has a full-time position of Water Conservation Supervisor and eight permanent support staff. The water conservation coordinator and conservation staff address the water conservation needs for the City of Fresno. Results will be monitored by recording and reporting the preparation, implementation and evaluation of the conservation plan.

Water Conservation Supervisor: Nora Laikam, hired 3-22-04.

Position was created: 8/1/88

Support Staff:

Staff Assistant (1)

Water Conservation Representatives (2)

Landscape Conservation Representatives (2)

Administrative Clerk (1)

Education Coordinator - contracted (1)

Industrial Commercial Water Conservation Representative (1)

Seasonal temporary employees are hired from April to November (3)

Water Conservation budget FY'04: \$578,362.17

Water Conservation staffing budget FY'04: \$373,416.56

See Attachment 8 – BMP #12 Water Conservation Job Position Specifications.

### 13. Water Waste Prohibition

*The program includes the following components:*

Enactment and enforcement of a water waste ordinance prohibiting gutter flooding, single-pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

*The City will annually collect and submit the following information:*

- a. Number of customers contacted about water waste violations.
- b. Number of customers cited for repeat water waste violations.

The City prohibits water waste through ordinances found in Article 1, Water Regulations, Section 14-119 of the Municipal Code. The City keeps records of water waste violations. This ordinance prohibits gutter flooding and single-pass cooling systems in new connections.

Two Water Conservation Representatives monitor customer water waste through field operations. Communication to Fresno's diverse customer base is always taken into consideration, so our representatives are bilingual and also speak either Hmong or Spanish. During the hot season, two to four temporary Water Conservation Representatives are hired to monitor late night and early morning over watering. A seasonal temporary Administrative Clerk is also hired to keep up with the additional paperwork generated.

See Appendix A – City Municipal Code, Article 1, Water Regulations, Section 14-119.

The program is marketed through media, billing inserts, promotional materials, public outreach events, speaker's bureau, and the City's web site. Upon implementation of the pilot program, the City will notify customers of its water survey program by including both interior and exterior water surveys.

See Attachment 1 – Customer Communication: Examples of communication opportunities and promotional materials currently used or available marketing programs for all BMP's.

#### 14. Residential ULFT Replacement Programs

*The program includes the following components:*

- a. Implementation of programs for replacing existing high-water-using toilets with ULFT (1.6 gallons or less) in single-family and multi-family residences.
- b. Programs shall be at least as effective as requiring toilet replacement at time of resale.

*The City will annually collect and submit the following information:*

- a. The average number of toilets per single-family and multi-family unit.
- b. The average persons per household for single-family residences and for multi-family residences.
- c. The housing resale rate for single-family and multi-family residences in service area.
- d. The number of ULFT installations credited to the agency's replacement program, by year.
- e. Estimated cost per ULFT replacement.
- f. Estimated water savings per ULFT replacement.

The City does not currently have a residential ULFT Replacement Program in place. Staff is proposing that the City begin a pilot program in 2006 offering rebates to rate payers to purchase ULFTs. The City will develop a more extensive program concurrent with its meter installation Program. The City anticipates that as meter installations begin in 2008, and the rate structure is reviewed, it will be easier to market this service to rate payers.

The City has begun discussions and investigations on how it will plan and conduct the pilot program. The City will contact the California Urban Water Council for assistance to help set up the pilot program. The City will also ask USBR to review its pilot study plan.

See Attachment 9 – BMP#14, Pilot Project Implementation Schedule and Budget Estimates. for Residential ULFT Replacement Program.

Actual Current Year Budget and Staff Time Summary

Year <u>2005</u>	BMP #	BMP Name	Actual Budget
	1	Residential Water Audits	\$0
	2	Residential Retrofit	Complete
	3	System Water Audit and Leak Detection	Not WC budget
	4	Metering w/Commodity Rates	\$0
	5	Landscape Water Audits	\$70,205
	6	Washing Machine Rebates	\$0
	7	Public Information	\$200,000
	8	School Education Program	\$45,811
	9	CII Conservation Programs	\$16,384
	10	Wholesale Agency Programs	\$0
	11	Conservation Pricing	\$0
	12	Conservation Coordinator	\$63,000
	13	Water Waste Prohibition	\$145,039
	14	ULFT Program	\$0
		Total	\$540,465

Projected Budget and Staff Time Summary

Year <u>2006</u>	BMP #	BMP Name	Proposed Budget
	1	Residential Water Audits	\$6,000
	2	Residential Retrofit	Complete
	3	System Water Audit and Leak Detection	Not WC budget
	4	Metering w/Commodity Rates	\$0
	5	Landscape Water Audits	\$50,000
	6	Washing Machine Rebates	\$0
	7	Public Information	\$200,000
	8	School Education Program	\$46,000
	9	CII Conservation Programs	\$8,000
	10	Wholesale Agency Programs	\$0
	11	Conservation Pricing	\$0
	12	Conservation Coordinator	\$63,000
	13	Water Waste Prohibition	\$145,000
	14	ULFT Program	\$17,400
		Total	\$535,400

Projected Budget and Staff Time Summary

Year 2007		Proposed
BMP #	BMP Name	Budget
1	Residential Water Audits	\$24,000
2	Residential Retrofit	Complete
3	System Water Audit and Leak Detection	Not WC budget
4	Metering w/Commodity Rates	\$0
5	Landscape Water Audits	\$70,000
6	Washing Machine Rebates	\$0
7	Public Information	\$200,000
8	School Education Program	\$46,000
9	CII Conservation Programs	\$15,000
10	Wholesale Agency Programs	\$0
11	Conservation Pricing	\$0
12	Conservation Coordinator	\$63,000
13	Water Waste Prohibition	\$145,000
14	ULFT Program	\$87,000
	Total	\$600,000

Projected Budget and Staff Time Summary

Year 2008		Proposed
BMP #	BMP Name	Budget
1	Residential Water Audits	\$43,000
2	Residential Retrofit	Complete
3	System Water Audit and Leak Detection	Not WC budget
4	Metering w/Commodity Rates	\$0
5	Landscape Water Audits	\$70,000
6	Washing Machine Rebates	\$0
7	Public Information	\$200,000
8	School Education Program	\$46,000
9	CII Conservation Programs	\$15,000
10	Wholesale Agency Programs	\$0
11	Conservation Pricing	\$0
12	Conservation Coordinator	\$50,000
13	Water Waste Prohibition	\$145,000
14	ULFT Program	\$180,000
	Total	\$606,000

See Attachment 10 – City of Fresno  
2003 Connection and Water Use Data  
2004 CUWCC BMP Actual Implementation  
2005 CUWCC BMP Implementation Plan  
2006 CUWCC BMP Implementation Plan  
2007 CUWCC BMP Implementation Plan

# **APPENDIX I**

---

## **Water Meter Plan Schedule**



## RESIDENTIAL WATER METER PLAN

Metering Plan is taken from the Central Valley Project (CVP) Water Supply Long-Term Renewal Contract between the United States and the City of Fresno dated February 2005.

Completion Date (mm/yy)	Item	Comments
03/05	Contract effective	Approved by Fresno City Council 7/19/05
01/06	Implementation Study	Select and obtain consultant study re implementation
01/06	Submit progress report to Bureau	U.S. Bureau of Reclamation
12/06	Confirmation of existing meters	Verify integrity and servicing of existing meters
01/07	Submit progress report to Bureau	U.S. Bureau of Reclamation
06/07	Secure installation contract	Begin implementation of consultant recommendations
12/07	Draft rate ordinance	Initial development of tiered rate structure
01/08	Submit progress report to Bureau	U.S. Bureau of Reclamation
01/08	Initiate retrofit	Begin installation of meters on existing dwellings
12/08	Meter installation progress	29% (30,000 of approximately 105,000 units installed)
01/09	Submit progress report to Bureau	U.S. Bureau of Reclamation
12/09	Meter installation progress	43% (45,000 units)
01/10	Submit progress report to Bureau	U.S. Bureau of Reclamation
03/10	Impose new rate ordinance (fees based on metered use)	New rate structure applicable to currently metered customers. Rates to be effective as new meter installations occur.
12/10	Meter installation progress	62% (65,000 units)
01/11	Submit progress report to Bureau	U.S. Bureau of Reclamation
12/11	Adopt new rate ordinance	81% (85,000 units)
01/12	Submit compliance report to Bureau	U.S. Bureau of Reclamation
12/12	Meter installation progress	100% (105,000 units)
01/13	Submit completion report	Retrofit complete

**Schedule subject to change due to unforeseen circumstances.**

**APPENDIX J**

---

**Draft WSCP Resolution**



**DRAFT RESOLUTION FOR USE BY CITY IF  
WATER SHORTAGE CONTINGENCY PLAN  
NEEDS TO BE IMPLEMENTED**

RESOLUTION NO. 200 \_\_ - \_\_

Adopted by the Fresno City Council

\_\_\_\_\_, 200\_\_

IMPLEMENTING STAGE *[1][2][3][4]* OF THE CITY OF FRESNO WATER SHORTAGE  
CONTINGENCY PLAN

BACKGROUND

The City of Fresno has three water supply sources: (1) Surface water from the Central Valley Project (CVP); (2) surface water from the Fresno Irrigation District (FID); and (3) local groundwater. The CVP supplies are provided to the City per the City's agreement with the United States Bureau of Reclamation (Bureau). FID supplies are provided to the City per the City's agreement with FID. Both surface water supplies are potentially subject to reduced deliveries during dry years. Existing regulations do not directly limit the use or expansion of groundwater pumping activities by the City; however, water quality issues or declining groundwater levels due to drought conditions may potentially limit future groundwater supplies.

Normally, the City's water supplies are adequate to meet the City's water demands. However, because of *[on-going drought conditions statewide][the required shutdown of the City's Water Treatment Plant due to \_\_\_\_\_][loss of groundwater production capacity due to \_\_\_\_\_][or describe other event]*, the Fresno City Council has determined that it is necessary to enact additional water conservation measures and water use restrictions, in addition to those already included in the City Municipal Code (Section 6-520 Wastage of Water), in order to reduce water use within the City's water service area.

City staff developed the City's original Water Shortage Contingency Plan in 1993. The original Water Shortage Contingency Plan was adopted by the Fresno City Council in 1994 and submitted to the California Department of Water Resources. The City's Water Shortage

**DRAFT RESOLUTION FOR USE BY CITY IF  
WATER SHORTAGE CONTINGENCY PLAN  
NEEDS TO BE IMPLEMENTED**

Contingency Plan was updated in 200\_\_, was included in the City's Urban Water Management Plan Update, and was adopted by the Fresno City Council on \_\_\_\_\_, 200\_\_.

The updated Water Shortage Contingency Plan includes four water conservation stages for a reduction in water use of up to 50 percent.

<u>Water Conservation Stage</u>	<u>Water Use Reduction Goal</u>
Stage 1: Minimal Shortage	Up to 10%
Stage 2: Moderate Shortage	10 to 25%
Stage 3: Severe Shortage	25 to 35%
Stage 4: Critical Shortage	35 to 50%

Each water conservation stage includes specific water conservation measures and water use restrictions designed to conserve water. Implementation of the water conservation stages shall be cumulative, meaning that implementation of a higher stage shall also include implementation of all lower stages. For example, if Stage 2 is to be implemented, all of the provisions in Stage 1 shall also be implemented. If Stage 3 is to be implemented, all of the provisions in Stages 1 and 2 shall also be implemented. If Stage 4 is to be implemented, all of the provisions in Stages 1, 2 and 3 shall also be implemented.

BASED ON THE FACTS SET FORTH IN THE BACKGROUND, THE CITY COUNCIL RESOLVES AS FOLLOWS:

Section 1. That the foregoing recitals are true and correct.

Section 2. That, based on the *[on-going statewide drought conditions][failure of the Water Treatment Plant][loss of groundwater production capacity]*, the Fresno City Council hereby declares that a water shortage emergency condition prevails within the water service area of the City and that water use within the City must be reduced by *[10, 25, 35, 50]* percent.

**DRAFT RESOLUTION FOR USE BY CITY IF  
WATER SHORTAGE CONTINGENCY PLAN  
NEEDS TO BE IMPLEMENTED**

Section 3. The required water use reduction described in Section 2 necessitates implementation of Stage [1, 2, 3, 4] of the City's Water Shortage Contingency Plan. The water conservation measures and water use restrictions for Stage [1, 2, 3, 4] are described below. Implementation of Stage [1, 2, 3, 4] shall be cumulative and shall also include implementation of the provisions of the Stages [1, 2, 3].

Stage 1 includes the following water conservation measures and water use restrictions for a reduction in water use of 10 percent:

1. The City shall initiate a public information/media campaign to:
  - a. Notify all customers of the water shortage and the need to conserve water,
  - b. Mail information to every customer explaining the importance of significant water use reductions,
  - c. Provide practical information to customers on ways to improve water use efficiency, and
  - d. Publicize and expand the toilet retrofit and other efficiency programs.
2. The City shall request customers to voluntarily reduce their water use by 10 percent. Such request shall include information on practical ways for customers to reduce their water use.
3. The City shall increase its water waste patrols to enforce the provisions of Fresno Municipal Code (Section 6-520 Wastage of Water).
4. All of the provisions of Fresno Municipal Code (Section 6-520 Wastage of Water) including, but not limited to, the three day per week outdoor irrigation schedule, no outdoor irrigation allowed on Mondays, and allowable times for outdoor irrigation, shall be enforced.

Stage 2 includes the following water conservation measures and water use restrictions for a reduction in water use of 25 percent:

**DRAFT RESOLUTION FOR USE BY CITY IF  
WATER SHORTAGE CONTINGENCY PLAN  
NEEDS TO BE IMPLEMENTED**

1. All of the provisions of Stage 1 shall be implemented as stated above, unless otherwise modified by these Stage 2 provisions.
2. The City shall intensify its public information campaign to inform the City's water customers of the need for water conservation and the provisions enacted by this Resolution.
3. The City shall further increase its water waste patrols to enforce the provisions of Fresno Municipal Code (Section 6-520 Wastage of Water).
4. Outdoor irrigation shall be limited to two days per week from March 2 to November 30. Locations bearing a street address ending in an odd number shall be permitted to irrigate only on Tuesday and Saturday. Locations bearing a street address ending in an even number shall be permitted to irrigate only on Wednesday or Sunday. There shall be no water irrigation on Mondays, Thursdays, or Fridays. Landscape irrigation shall only be allowed between the hours of *[insert hours—Municipal code already prohibits irrigation between 11:00 am and 7:00 pm and 6:00 am to 8:00 am]. [or allow only irrigation of trees and shrubs, but not turf]*.
5. Outdoor irrigation shall be prohibited from December 1 to March 1.
6. Car washing shall be allowed with the use of a bucket only (a hose equipped with a shut-off nozzle may be used for a quick rinse).

Stage 3 includes the following water conservation measures, water use restrictions and water use allotments for a reduction in water use of 35 percent:

1. All of the provisions of Stages 1 and 2 shall be implemented as stated above, unless otherwise modified by these Stage 3 provisions.
2. The City shall continue its public information campaign to inform the City's water customers of the need for water conservation and the provisions enacted by this Resolution.
3. The City shall intensify its leak detection program.

**DRAFT RESOLUTION FOR USE BY CITY IF  
WATER SHORTAGE CONTINGENCY PLAN  
NEEDS TO BE IMPLEMENTED**

4. Outdoor irrigation shall be limited to one day per week using manual application only from March 2 to November 30. Use of automatic sprinkler systems shall be prohibited. Locations bearing a street address ending in an odd number shall be permitted to irrigate only on Saturday. Locations bearing a street address ending in an even number shall be permitted to irrigate only on Sunday. There shall be no water irrigation on Mondays, Tuesdays, Wednesdays, Thursdays, or Fridays. Landscape irrigation shall be prohibited between the hours of *[insert hours—Municipal code already prohibits irrigation between 11:00 am and 7:00 pm and 6:00 am to 8:00 am]. [or allow only irrigation of trees and shrubs, but not turf]*.
5. Outdoor irrigation shall be prohibited from December 1 to March 1.
6. Car washing shall be allowed with the use of a bucket only (a hose equipped with a shut-off nozzle may be used for a quick rinse).
7. The City shall not issue building permits or install meters for new accounts which had not received building permits before the water shortage emergency declaration *[or continue to allow building permits, but do not allow new landscaping to be installed]*.
8. The following water use allotments shall be established:
  - a. Single-family residential customers: 110 percent of average normal wintertime residential per capita water use based on January/February *[insert year]* actual water use.
  - b. Multi-family residential customers: 110 percent of average normal wintertime residential per capita water use based on January/February *[insert year]* actual water use.
  - c. Commercial/institutional customers: 85 percent of average annual usage based on *[insert year]* actual water use.
  - d. Industrial customers: 85 percent of average annual usage based on *[insert year]* actual water use.

**DRAFT RESOLUTION FOR USE BY CITY IF  
WATER SHORTAGE CONTINGENCY PLAN  
NEEDS TO BE IMPLEMENTED**

- e. Landscape irrigation customers: 50 percent of average annual usage based on *[insert year]* actual water use.
9. Compliance with the water use allotments listed above shall be assessed by the City on a monthly basis. Metered customers found not to be in compliance with the enacted water use allotments shall be subject to penalties in accordance with Section 6-520 of the City Municipal Code.

Stage 4 includes the following water conservation measures, water use restrictions and water use allotments for a reduction in water use of 50 percent:

1. All of the provisions of Stages 1, 2 and 3 shall be implemented as stated above, unless otherwise modified by these Stage 4 provisions.
2. The City shall continue its public information campaign to inform the City's water customers of the need for water conservation and the provisions enacted by this Resolution.
3. Outdoor irrigation of shall be prohibited.
4. No restaurant, hotel, café, cafeteria or other public place where food is sold, served, or offered for sale, shall serve drinking water to any customer unless expressly requested.
5. The use of potable water to clean, fill or maintain decorative fountains, lakes or ponds unless such water is reclaimed shall be prohibited.
6. The use of potable water for construction, compaction, dust control, street or parking lot sweeping, building wash down where non-potable or recycled water is sufficient shall be prohibited.
7. The use of potable water for sewer system maintenance or fire protection training without prior approval by the City Manager shall be prohibited.

***DRAFT RESOLUTION FOR USE BY CITY IF  
WATER SHORTAGE CONTINGENCY PLAN  
NEEDS TO BE IMPLEMENTED***

8. The use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except where necessary for public health or safety shall be prohibited.
9. Allowing potable water to escape from breaks within the customer's plumbing system for more than twenty-four (24) hours after the customer is notified or discovers the break shall be prohibited.
10. Washing cars, boats, trailers, aircraft, or other vehicles except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment shall be prohibited.
11. Covers for swimming pools shall be required when not in use.
12. The use of outdoor misters shall be prohibited.
13. The following water use allotments shall be established:
  - a. Single-family residential customers: 95 percent of average normal wintertime residential per capita water use based on January/February *[insert year]* actual water use.
  - b. Multi-family residential customers: 95 percent of average normal wintertime residential per capita water use based on January/February *[insert year]* actual water use.
  - c. Commercial/institutional customers: 65 percent of average annual usage based on *[insert year]* actual water use.
  - d. Industrial customers: 75 percent of average annual usage based on *[insert year]* actual water use.
  - e. Landscape irrigation customers: 0 percent of average annual usage based on *[insert year]* actual water use.
14. Compliance with the water use allotments listed above shall be assessed by the City on a monthly basis. Metered customers found not to be in

**DRAFT RESOLUTION FOR USE BY CITY IF  
WATER SHORTAGE CONTINGENCY PLAN  
NEEDS TO BE IMPLEMENTED**

compliance with the enacted water use allotments shall be subject to penalties in accordance with Section 6-520 of the City Municipal Code.

Section 4. Implementation of Stage *[3, 4]* *[for continuation of Stage 1 or 2 or higher stages for more than two consecutive years]* of the City's Water Shortage Contingency Plan will include a water rate increase of *[\_\_\_]* percent over water rates in place at the time of approval of this resolution. Said water rate increase will apply to all water customers, both flat rate and metered, and shall remain in effect until modified or revoked by the City.

Section 5. Notices required to be given pursuant to the provisions of this Resolution shall be in writing and may be combined with water service bills, or other written communications, and shall be delivered personally, or by posting with the United States Postal Service, and addressed to the last known address shown on the City's billing records for the user to whom given, or to the owner of the premises to which water service of such user pertains, shown on the last equalized assessment role of the Fresno County Assessor.

Section 6. That the City Manager is hereby authorized and empowered to delegate his or her authority hereunder to such assistants, deputies, officers, employees, or agents of the City as he or she shall designate, and to establish such rules, regulations, and procedures, and to prepare or furnish such forms, as he or she deems necessary or appropriate to carry out the provisions of this Resolution.

Section 7. In the event any person shall violate any of the provisions of this Resolution, the violations and penalties set forth in the Fresno Municipal Code Section 6-520 Wastage of Water shall apply. Appeals of a notice of violation shall be in accordance Fresno Municipal Code.

Section 8. In the event that any provision of this Resolution conflicts with any provision of any other ordinance, resolution, regulation, rule, order, or permit of this City, the

**DRAFT RESOLUTION FOR USE BY CITY IF  
WATER SHORTAGE CONTINGENCY PLAN  
NEEDS TO BE IMPLEMENTED**

provisions of this Resolution shall govern and control over the provisions in conflict therewith.

Section 9. The Fresno City Council declares this Resolution to be necessary as an emergency measure for the immediate preservation of public peace, health or safety for the reasons set forth in Section 2. This Resolution shall be effective upon its adoption, and shall remain effective until the conditions described in Section 2 are resolved, under which case this Resolution shall be rescinded, or until conditions described in Section 2 worsen, thus requiring additional action by the City Council, under which case a subsequent Resolution will be considered for adoption.

Adopted by the City of Fresno City Council on \_\_\_\_\_, 200\_\_ by the following vote:

Ayes: \_\_\_\_\_

Noes: \_\_\_\_\_

Abstain: \_\_\_\_\_

Absent: \_\_\_\_\_

\_\_\_\_\_  
Mayor

Attest:

\_\_\_\_\_  
City Clerk