



FINAL

2015 Urban Water Management Plan *for* San Juan Water District



Prepared by

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San Juan Water District
2015 Urban Water
Management Plan Update

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Prepared for

San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

K/J Project No. 1570026*00

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List of Abbreviations and Acronyms

The following abbreviations and acronyms are used in this report

Guidebook	2015 UWMP Guidebook for Urban Water Suppliers
AB	Assembly Bill
Act	Urban Water Management Planning Act (also Act of 1983)
AF	Acre-feet
AFY	Acre-feet per year
AMI	Advanced Metering Infrastructure
Audit	Distribution System Water Audit
AWWA	American Water Works Association
Baseline GPCD	Baseline Daily Per Capita Water Use
BMP	Best Management Practice
CCSCE	Center for Continuing Study of the California Economy
CHWD	Citrus Heights Water District
CII	Commercial, Industrial, and Institutional
CIP	Capital Improvements Project
CIMIS	California Irrigation Management Information System
CMMS	Computer Maintenance Management System
COG	Council of Governments
CUEA	California Utilities Emergency Association
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWC	California Water Code
District	San Juan Water District
DMM	Demand Management Measure

DOF	California State Department of Finance
DRU	Demographic Research Unit
DWR	California Department of Water Resources
ETo	Evapotranspiration
EDAW	EDAW, Inc.
Folsom	City of Folsom
FOWD	Fair Oaks Water District
GIS	Geographical Information System
GPCD	Gallons per capita day
GPD	gallons per day
GPF	gallons per flush
GPM	gallons per minute
HCD	State Department of Housing and Community Development
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
IRR	Irrigation
IRWM	Integrated Regional Water Management
JPA	Joint Powers Agreement
M&I	Municipal and Industrial
MG	Million Gallons
MGD	Million Gallons per day
MIE	Media in Education
MOU	Memorandum of Understanding
OVWC	Orange Vale Water Company
PCWA	Placer County Water Agency
Plan	Urban Water Management Plan 2015

Regional San	Sacramento Regional County Sanitation District
RHNA	Regional Housing Needs Allocation
Roseville	City of Roseville
RWA	Regional Water Authority
SACOG	Sacramento Area Council of Governments
SB	Senate Bill
SB X7-7	Senate Bill No. 7 (also Water Conservation Act of 2009)
SFR	Single Family Residential
SGA	Sacramento Groundwater Authority
SGMA	Sustainable Groundwater Management Act of 2014
SJWD	San Juan Water District
SRWTP	Sacramento Regional Wastewater Treatment Plant
SSWD	Sacramento Suburban Water District
Station	Antelope Booster Pump-Back Station
SWRCB	State Water Resources Control Board
SWRI	Surface Water Resources, Inc.
ULFT	Ultra-Low Flow Toilet
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WARN	Water Agency Response Network
WBIC	Weather-Based Irrigation Controller
WEL	Water Efficiency Landscape
WRCC	Western Regional Climate Center

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Definitions

Chapter 2, Part 2.6, Division 6 of the California Water Code provides definitions for the construction of the Urban Water Management Plans.

CHAPTER 2. DEFINITIONS

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

Section 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.

Section 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.

Section 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.

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

Section 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, and 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.

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

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

Section 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.

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Chapter 1: Introduction and Overview

San Juan Water District (SJWD, District) is a water utility agency providing water to both retail customers and wholesale customer agencies in Sacramento and Placer counties. This Urban Water Management Plan (UWMP) provides detailed customer information for the District's retail service area and summary information for its wholesale customer agencies, addressing both the retail and wholesale requirements for urban water suppliers.

1.1 Background and Purpose

This UWMP has been prepared for SJWD in compliance with Division 6, Part 2.6, of the California Water Code (CWC), Sections 10608 through 10657 as last amended by Senate Bill No. 1420 and Assembly Bill (AB) No. 2067 in September 2014. The original bill requiring preparation of an UWMP was enacted in 1983.

Urban water suppliers having more than 3,000 service connections or supplying more than 3,000 acre-feet per year (AFY) for retail or wholesale uses are required to submit an UWMP every five years to the California Department of Water Resources (DWR). The Urban Water Management Planning Act (Act) requires urban water suppliers to describe and evaluate sources of water supply, efficient uses of water, demand management measures (DMMs), implementation strategy and schedule, and other relevant information and programs. An UWMP is required in order for a water supplier to be eligible for DWR administered state grants and loans and for drought assistance.

It is the purpose of this UWMP to provide the supporting documentation to meet the stated concerns and declarations of the Urban Water Management Planning Act of 1983 (Act). The portion of the Act that describes the concerns of the legislature is in Section 10610.2.

As with SJWD's previous plans, the 2015 UWMP does not explicitly discuss specific activities undertaken by its wholesale customer agencies unless it relates to one of the District's water demand, supply management, or conservation programs. Each wholesale customer agency will discuss these activities in its individual 2015 UWMP. Information from the District's 2015 UWMP may be used by local water suppliers in the preparation of their own plans, although it is not mandatory for local agencies to rely on the District's plan because participation in any regional planning activity is voluntary (pursuant to CWC § 10620). The information included in the 2015 UWMP represents the most current available planning projections of supply capability and demand developed through a collaborative process with the wholesale customer agencies.

The Act requires reporting agencies to describe its water supply reliability under single dry-year, multiple dry-year, and average year conditions, with projected information in five-year increments for a minimum of 20 years. One of the purposes of this UWMP is to ensure the efficient use of available water supplies, as required by the Act. The Act states that urban water suppliers should make every effort to assure 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 years. The UWMP describes the availability of water and discusses water use, reclamation, and water conservation activities. This UWMP concludes that the water supplies available to the District's retail and wholesale customer agencies are adequate over the next 25-year planning period.

1.2 Urban Water Management Planning and the California Water Code

1.2.1 Urban Water Management Planning Act of 1983

The Act became part of the CWC with the passage of AB 797 during the 1983–1984 regular session of the California legislature. Subsequently, assembly bills between 1990 and 2014 amended the Act to include additional data and reporting requirements. The Act describes the contents of the UWMP as well as how urban water suppliers should adopt and implement the UWMP and was updated most recently by Senate Bill (SB) 1420 and AB 2067.

This UWMP addresses all subjects required by Section 10631 of the Act which permits “levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.” All applicable sections of the Act are discussed in this UWMP, with chapters of the UWMP and DWR Guidebook Checklist cross-referenced against the corresponding provision of the Act. A completed copy of the DWR 2015 UWMP Checklist organized by subject is included as Appendix A.

1.2.2 Applicable Changes to the CWC Since 2010 UWMPs

Since 2010, four legislative bills (AB 2409 in 2010, Senate Bill 1036 in 2014, AB 2067 in 2014, and Senate Bill 1420 in 2014) have made changes to the CWC affecting requirements and guidance for UWMP development. A summary list of the topical changes is provided below:

- Demand Management Measures, CWC Section 10631(f)(1) and (2), Guidebook Ch. 9
- Submittal Date, CWC Section 10621(d), Guidebook Ch. 10
- Electronic Submittal, CWC Section 10644(a)(2), Guidebook Ch. 10
- Standardized Forms, CWC Section 10644(a)(2), Guidebook Ch. 10
- Water Loss, CWC Section 10631(e)(1)(J) and (e)(3)(A) and (B), Guidebook App. L
- Estimating Future Water Savings, CWC Section 10631(e)(4), Guidebook App. K
- Voluntary Reporting of Energy Intensity, CWC Section 10631.2(a) and (b), Guidebook App. O
- Defining Water Features, CWC Section 10632(b), Guidebook Ch. 4

1.2.3 Water Conservation Act of 2009 (SBX7-7)

Senate Bill No. 7 (SB X7-7), which became law in November 2009, requires increased emphasis on water demand management and requires the state to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. Retail urban water suppliers are required to report their Baseline Daily Per Capita Water Use (Baseline GPCD), 2015 interim Urban Water Use Target, 2020 Urban Water Use Target, and Compliance Daily per Capita Water Use. The Baseline GPCD, Targets, and methodologies are presented in Chapter 5.

SJWD water use reduction targets were developed in 2010 based on Compliance Method 1 as described by SB X7-7 and supplemental guidance from DWR. The Water Conservation Act of 2009 also allows water suppliers to establish water use targets through regional alliances with

wholesale water suppliers. SJWD and its wholesale customer agencies are not currently engaged in a regional alliance, and have not established a regional target.

1.3 Urban Water Management Plans in Relation to Other Efforts

SJWD's wholesale customer agencies are in the process of developing UWMPs for their respective systems. SJWD has coordinated data sharing and Plan review between the wholesale customer agencies with the intent of providing consistent water demand, supply, and reliability data for the region. The District has provided Draft copies of the Plan for wholesale customer agency review and has made an effort to review and provide comment on information provided by the wholesale customer agencies.

1.4 UWMP Organization

Pursuant to the Act, the District previously prepared an UWMP in 2010, which was submitted to Department of Water Resources (DWR) on August 1, 2011 and approved by DWR on February 29, 2012. The 2015 UWMP serves as an update to the 2010 UWMP and draws extensively from that report; however, this plan has been restructured in response to legislative changes discussed above and new requirements presented in the 2015 UWMP Guidebook for Urban Water Suppliers (Guidebook) developed by DWR.

SJWD has organized its 2015 UWMP following DWR's recommended outline from the 2015 UWMP Guidebook. SJWD has also elected to present data in this UWMP using the required DWR Tables as presented in the Guidebook. Additional tables are used to provide further clarification.

1.5 UWMPs and Grant or Loan Eligibility

Beginning in 2016, urban retail water suppliers must comply with water conservation requirements in the Water Conservation Act of 2009 (SB X7-7) in order to be eligible for State of California water grants and loans. Retail water suppliers can meet these requirements through:

1. Meeting its 2015 Interim Urban Water Use Target and reporting compliance in the 2015 UWMP,
2. Submitting documentation qualifying its entire service area as a disadvantaged community.

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Chapter 2: Plan Preparation

2.1 Basis for Preparing a Plan

CWC 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...

CWC 10620

(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.

CWC 10621

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero, except as provided in subdivision (d).

(d) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

In accordance with the CWC, urban water suppliers with 3,000 or more service connections or supplying 3,000 or more AFY are required to prepare an UWMP every five years.

SJWD directly supplies more than 3,000 AFY to its retail customers and manages more than 3,000 service connections, meeting the threshold for UWMP preparation as a retail supplier. It also indirectly supplies more than 3,000 AFY through the wholesale customer agencies, meeting the threshold for UWMP preparation as a wholesale supplier. Therefore, this UWMP utilizes DWR’s guidance and recommendations for addressing CWC requirements, as outlined in the 2015 Guidebook, as both a retail and wholesale agency.

SJWD prepared this UWMP with the assistance of its consultant, Kennedy/Jenks Consultants, as permitted by the following section of the Act:

CWC 10620

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

2.1.1 Public Water Systems

CWC 10644

- (a)(2) *The plan, or amendments to the plan, submitted to the department ... shall include any standardized forms, tables, or displays specified by the department.*

CWC 10608.52

- (a) *The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.*
- (b) *At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24... The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.*

California Health and Safety Code 116275

- (h) *"Public Water System" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.*

SJWD is a community services district established by a vote of the citizens in 1954, formed under Section 61000 et seq., Title 6, Division 3 of the California Government Code Water Code, Section 3000. SJWD's retail water system meets the definition of a Public Water System (Public Water System #3410021) and is regulated by the State Water Resources Control Board, Division of Drinking Water.

2.1.2 Agencies Serving Multiple Service Areas/Public Water Systems

SJWD manages a single retail water system, as listed in Table 2-1. The District also provides water to four wholesale customer agencies managing their own retail water systems. Details of the wholesale customer agencies' water systems are described in their respective UWMPs.

Table 2-1: Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA3410021	San Juan Water District	10,582	9,273
TOTAL		10,582	9,273
NOTES: 1. Volume of Water Supplied in AF.			

2.2 Regional Planning

SJWD regularly coordinates with other agencies, cities, and counties as part of its regular business operations and planning efforts. The District maintains contracts with its four wholesale customer agencies: Citrus Heights Water District (CHWD), Fair Oaks Water District (FOWD),

Orange Vale Water Company (OVWC), and the City of Folsom (Folsom). The District also contracts with City of Roseville (Roseville) and Sacramento Suburban Water District (SSWD) to provide water from SJWD on an as-available basis, and therefore, are not considered wholesale customer agencies for the purposes of this UWMP.

The District is a participating agency in the Sacramento Groundwater Authority (SGA), a member of the Water Forum and signatory of the Water Forum Agreement, and is a Regional Water Authority (RWA) member. The District is in the process of developing a conjunctive use program intended to increase water supply reliability for the SJWD wholesale service area, including SJWD retail service area, as well as offset groundwater pumping of other agencies in the region. Reducing groundwater pumping would in turn, maximize groundwater storage within the region, which could be used by SJWD in dry years or provide a regional or statewide benefit and provide a financial benefit to SJWD customers. The proposed conjunctive use program and projected impacts are discussed further in Chapter 4.2.1. SJWD plans to continue to prioritize coordination with other agencies during its planning processes.

2.3 Individual or Regional Planning and Compliance

Water suppliers can choose to develop an individual UWMP or work together with an Integrated Regional Water Management (IRWM) group, wholesaler, or other retailers to develop a Regional UWMP or Regional Alliance. SJWD has elected to develop an individual UWMP for its system as shown in Table 2-2.

Table 2-2: Plan Identification	
<input checked="" type="checkbox"/>	Individual UWMP
<input type="checkbox"/>	Regional UWMP (RUWMP)
NOTES:	

2.4 Fiscal or Calendar Year and Units of Measure

<p><i>CWC 1608.20</i></p> <p>(a)(1) <i>Urban retail water suppliers...may determine the targets on a fiscal year or calendar year basis.</i></p>

SJWD reports on a calendar year basis and has included water use and planning data for the entire calendar year of 2015. Water volumes are reported in acre-feet (AF) throughout this UWMP. Table 2-3 summarizes the selected reporting method and unit of measure below.

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
<input checked="" type="checkbox"/>	Agency is a wholesaler
<input checked="" type="checkbox"/>	Agency is a retailer
Fiscal or Calendar Year (select one)	
<input checked="" type="checkbox"/>	UWMP Tables Are in Calendar Years
<input type="checkbox"/>	UWMP Tables Are in Fiscal Years
Units of Measure Used in UWMP (select one)	
<input checked="" type="checkbox"/>	Acre Feet (AF)
<input type="checkbox"/>	Million Gallons (MG)
<input type="checkbox"/>	Hundred Cubic Feet (CCF)
NOTES:	

2.5 Coordination and Outreach

The Act requires that water suppliers coordinate the preparation of its UWMP, to the extent practicable, with other appropriate agencies in the area including other water suppliers that share a common source, water management agencies, and relevant public agencies. The 2015 UWMP requirements for agency coordination include specific timetables and requirements as presented in this chapter. During the preparation of the UWMP, documents that have been prepared over the years by SJWD and other entities were reviewed and information from those documents incorporated, as applicable, into this UWMP. The list of references is provided at the end of this document.

2.5.1 Wholesale and Retail Coordination

CWC 10631

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

As a wholesale agency, SJWD provided the identified and quantified water supplies available for average, single-dry, and multiple-dry years projected through 2040 to their wholesale customer agencies listed in Table 2-4a and included in Appendix B. Retail water agencies are required to provide their wholesaler with the retail agency's projected water demand for 20

years. The District received projected water demands from each of their wholesale customer agencies for the 2015 UWMP.

Table 2-4a: Wholesale: Water Supplier Information Exchange	
<input type="checkbox"/>	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with CWC 10631. Completion of the table below is optional. If not completed include a list of the water suppliers that were informed.
<input checked="" type="checkbox"/>	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631. Complete the table below.
Water Supplier Name	
Citrus Heights Water District	
Fair Oaks Water District	
Orange Vale Water Company	
City of Folsom	
NOTES:	

SJWD is the sole provider of water to its retail system as shown in Table 2-4b below:

Table 2-4b: Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
San Juan Water District
NOTES:

2.5.2 Coordination with Other Agencies and the Community

<p>CWC 10620</p> <p><i>(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.</i></p> <p>CWC 10642</p> <p><i>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.</i></p>

Table 2-5 lists the agencies with which coordination occurred while preparing this 2015 UWMP. The initial coordination began in February 2016, which included the distribution of letter notifications and requests for information. Each notification letter was followed up with e-mails or telephone calls as necessary to obtain supporting data and coordinate preparation of the UWMP. Table 2-5 also provides a list of agencies that were provided public hearing notifications and access to the draft UWMP which is discussed in further detail in Chapter 10 and included in Appendix C.

Table 2-5: Coordination with Agencies						
Agency	Contacted for Assistance	Participated in UWMP Development	Commented on the Draft	Attended Public Hearing	Received Copy of the Draft	Sent Notice of Intent to Adopt
Citrus Heights Water District	✓	✓			✓	✓
City of Citrus Heights					✓	✓
City of Folsom	✓	✓			✓	✓
City of Roseville					✓	✓
Fair Oaks Water District	✓	✓			✓	✓
Orange Vale Water Company	✓	✓			✓	✓
County of Placer, Planning Department					✓	✓
County of Placer, Public Information Office					✓	✓
Placer County Water Agency	✓	✓			✓	✓
County of Sacramento, Department of Water Resources					✓	✓
County of Sacramento, Department of Planning & Community Development					✓	✓
Sacramento Regional County Sanitation District	✓				✓	✓

SJWD encourages community participation in water planning. Table 2-6 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials, including paid advertisements, website postings and invitation letters are attached in Appendix C.

Table 2-6: Public Participation Timeline		
Public Workshops and Hearings	Date	Public Participation Task
Newspaper Advertisement #1	May 4, 2016	Notice of public hearing and location of Plan for public inspection
Newspaper Advertisement #2	May 11, 2016	Notice of public hearing and location of Plan for public inspection
Public Hearing	May 25, 2016	Public Hearing for Final Draft 2015 UWMP
Plan Adoption	June 8, 2016	Adoption Hearing for Final 2015 UWMP
Plan Submittal	June 27, 2016	File 2015 UWMP with DWR within thirty days of adoption

2.5.3 Notice to Cities and Counties

CWC 10621 (b)

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

Notifications of preparation of the plan were provided to cities and counties within which SJWD provides water at least 60 days in advance of the public hearing as required by the Act (see Appendix C). Copies of the draft plan were available for review at SJWD’s office and posted on SJWD’s website prior to the public hearing. Additional information and documentation regarding notification and the Plan adoption process is presented in Chapter 10.

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Chapter 3: System Description

3.1 General Description

CWC Section 10631

Describe the service area of the supplier.

San Juan Water District is both a wholesale and retail water supplier, governed by an elected Board of Directors. The District provides water service to retail customers and wholesale customer agencies in northeastern Sacramento and southern Placer Counties. The wholesale portion of the District is forty-five square miles comprised of the following wholesale customer agencies: Citrus Heights Water District (CHWD), Fair Oaks Water District (FOWD), Orange Vale Water Company (OVWC), and the City of Folsom.

The District's retail service area is seventeen square miles, mostly rural in character with large parcel sizes, and maintains the identity as a scenic, tranquil, family-oriented rural/residential community located just east of Roseville and west of Folsom Lake. The Placer County portion of SJWD's retail service area is approximately 75 percent of the District's retail service area. According to the revised Placer County 2012 Granite Bay Community Plan, population, housing and employment in the Granite Bay area will continue to grow at a minimal rate.

3.2 Service Area Boundary Maps

Figure 3-1 illustrates the location of the District's wholesale customer agencies' service areas. Only a portion of the City of Folsom, the Ashland area, is served wholesale water by SJWD. The wholesale customer agencies' service areas do not include Sacramento Suburban Water District or City of Roseville, which receive water from SJWD on an as-available basis. Figure 3-2 illustrates the SJWD Retail service area.

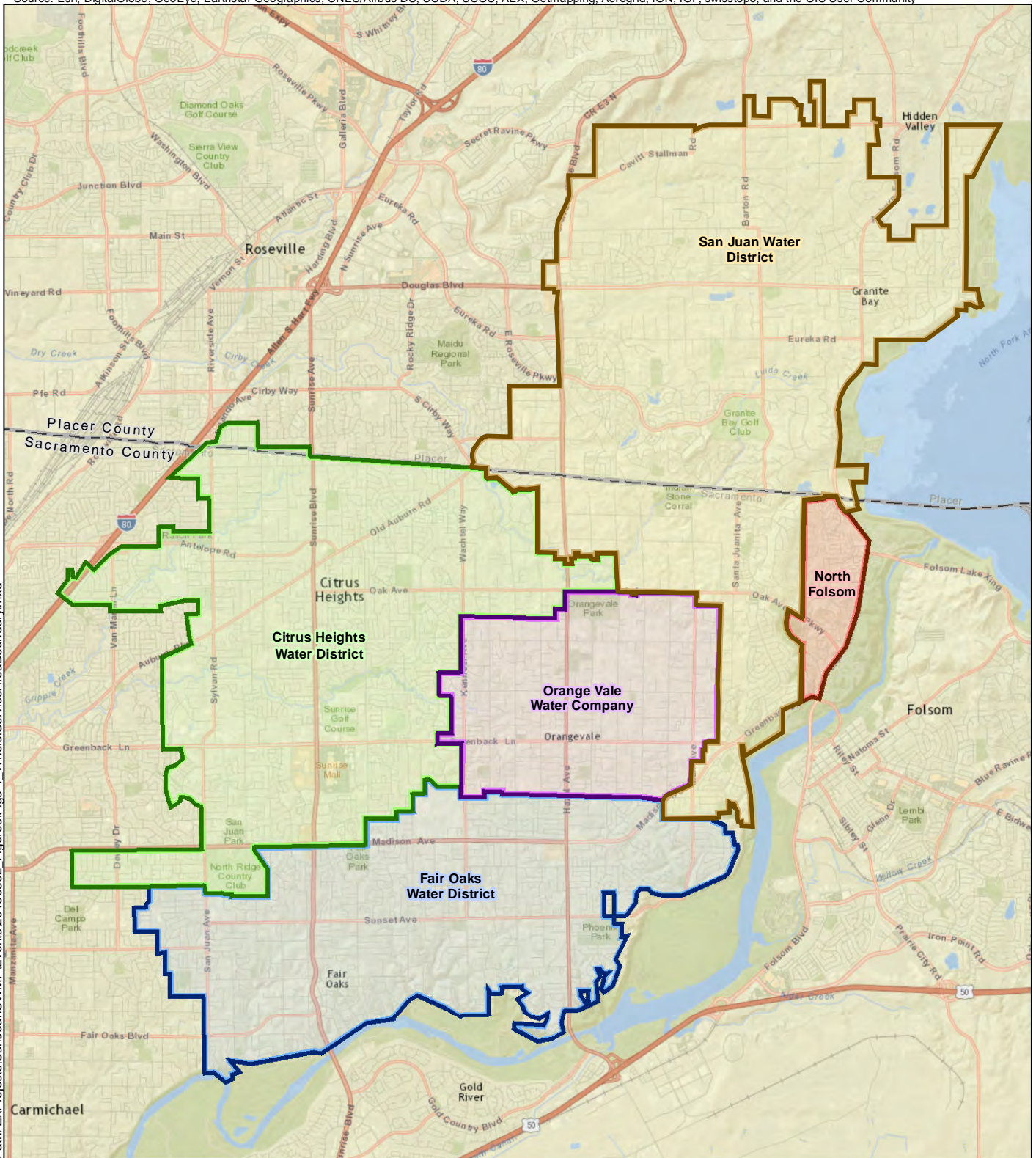
3.3 Service Area Climate






CWC Section 10631

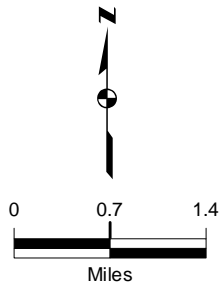
Describe the service area of the supplier, including... climate...

SJWD has cool winters and hot, dry summers. The Western Regional Climate Center (WRCC) maintains 30 years of historic climate data for select cities only. WRCC does not have a station within the SJWD service area boundary and therefore the Folsom station was utilized for the climate data analysis. The Folsom station is located less than one mile outside the district service area and adequately represents the climate data for SJWD. The WRCC's website (www.wrcc.dri.edu) has maintained historical climate records for the Folsom Dam station for 1955-1993. Figure 3-3 presents the monthly average climate summary based on the historical data for Folsom Dam.

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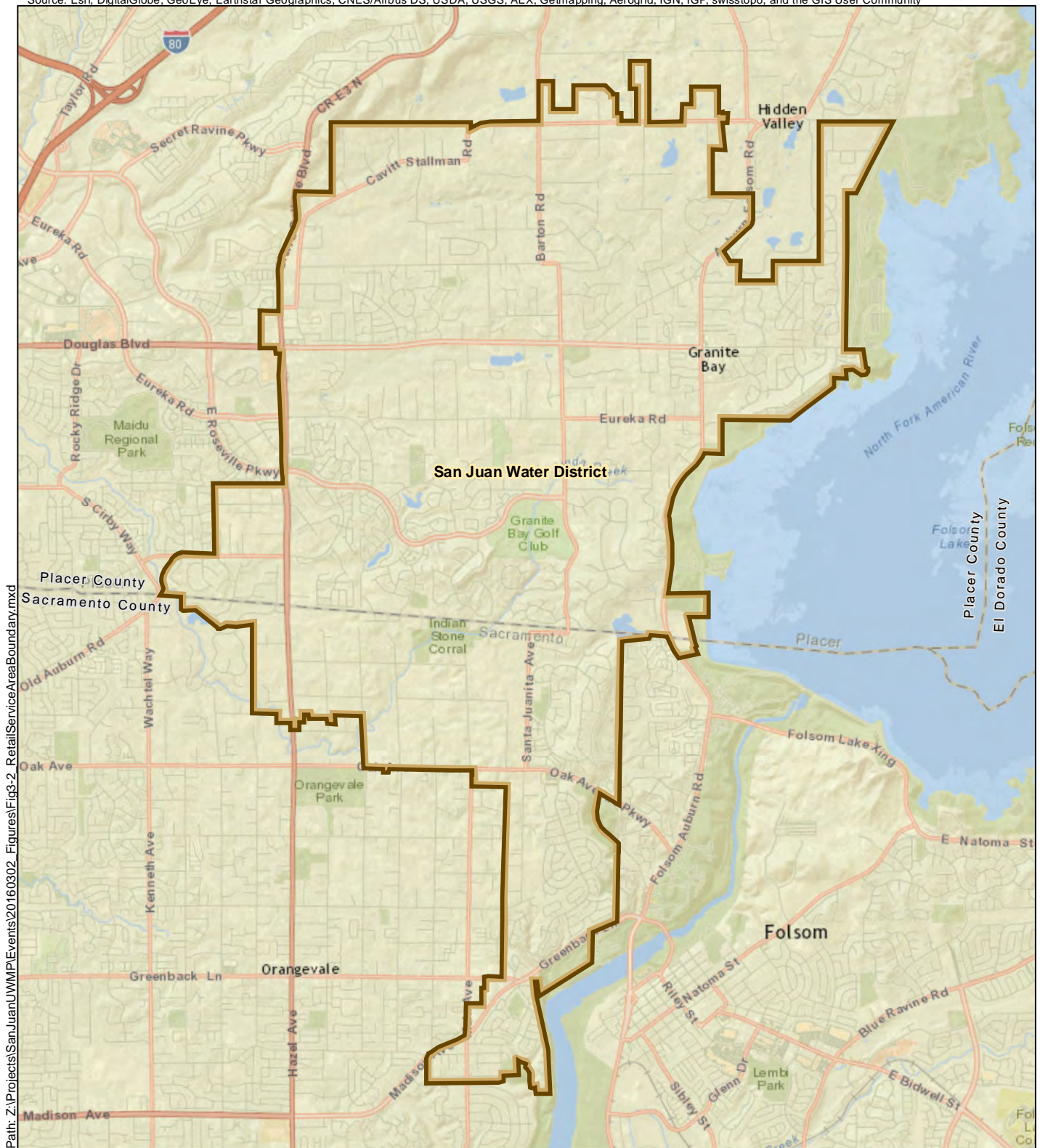
- Legend**
-  San Juan Water District
 -  North Folsom
 -  Orange Vale Water Company
 -  Fair Oaks Water District
 -  Citrus Heights Water District



Kennedy/Jenks Consultants
 San Juan Water District
 2015 Urban Water Management Plan


Wholesale Service Area Boundary

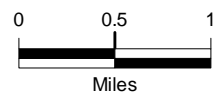
K/J 1570026*00
 June 2016
Figure 3-1



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Legend

 San Juan Water District



Kennedy/Jenks Consultants

San Juan Water District
 2015 Urban Water Management Plan

Retail Service Area Boundary

K/J 1570026*00
 June 2016

Figure 3-2

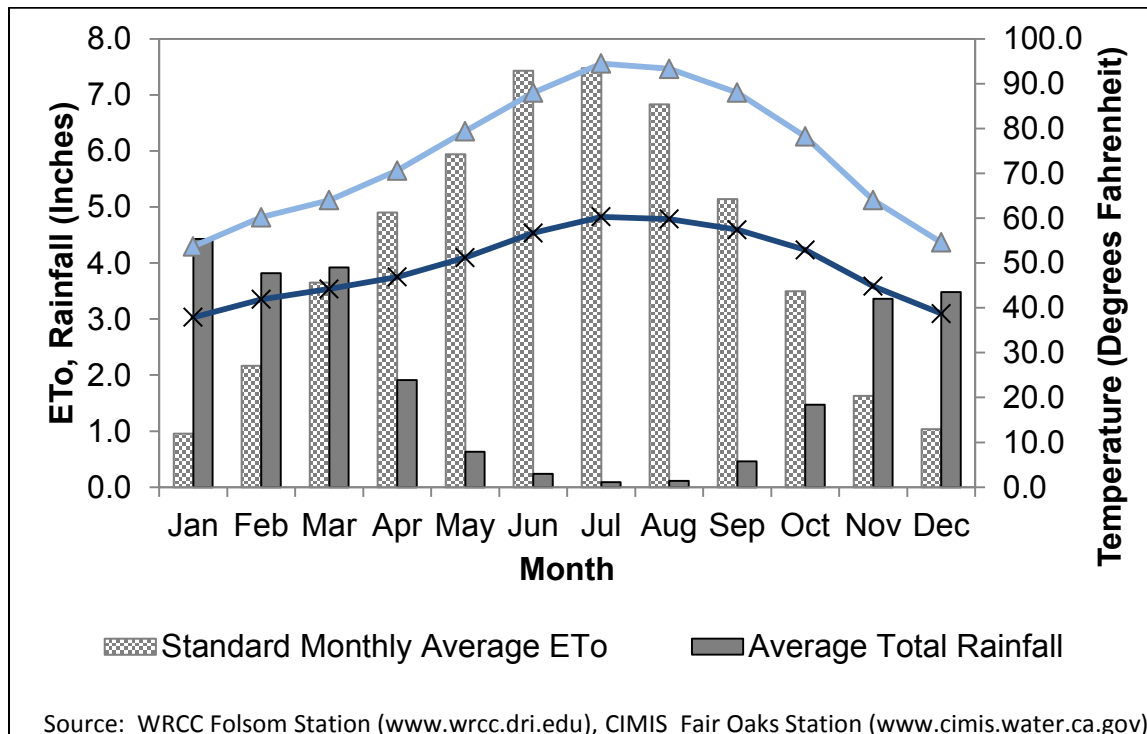


Figure 3-3: Monthly Average Climate for the San Juan Water District

Similar to the WRCC, the California Irrigation Management Information System (CIMIS) website (<http://www.cimis.water.ca.gov>) tracks and maintains records of evapotranspiration (ETo) for select cities only. ETo statistics used for this system come from the Fair Oaks station. ETo is a standard measurement of environmental parameters that affect the water use of plants. ETo is given in inches per day, month, or year and is an estimate of the ETo from a large field of well-watered, cool-season grass that is 4- to 7-inches tall. The monthly average ETo is presented in inches in Figure 3-3. As Figure 3-3 indicates, a greater quantity of water is evaporated from April through October in correlation to high temperatures and low humidity, which will result in high water demands.

In the winter, the lowest average monthly temperature is approximately 38 degrees Fahrenheit. The highest average monthly temperature reaches approximately 95 degrees Fahrenheit in the summer. The rainy season is typically from November to March with monthly precipitation ranging from 3 to 5 inches. Low humidity occurs in the summer months from May to September. The combination of hot and dry weather during the summer months typically results in moderately high water demand.

3.4 Service Area Population and Demographics

CWC Section 10631

Describe the service area of the supplier, including current and projected population ...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.

3.4.1 Retail Population

In 2015, the estimated population of the District’s retail service area was 29,444, according to the DWR Population Tool and methodology described in Chapter 5. Population projections for the District’s retail service area has been updated based on growth rate data from the 2012 Granite Bay Community Plan and the 2012 Sacramento Area Council of Governments (SACOG) projections.

Granite Bay updated its projections in 2012 for population, housing, and employment growth through the year 2035 using 2010 US Census Data, SACOG projections, and Placer County Projections. The Granite Bay Community Plan utilized land use and development along with a build out analysis to refine the projections.

SACOG population, housing, and employment data are derived from the 2000 U.S. Census, California State Department of Finance (DOF), Demographic Research Unit (DRU) Info USA employment data, regional growth targets data from the Center for Continuing Study of the California Economy (CCSCE), and the General Plan from the Sacramento Region Blueprint Project. A detailed explanation of the population, household and employment projection process employed by SACOG can be found in the document *Projections of Employment, Population, Households, and Household Income in the SACOG Region for 2000-2050*. The 2014 release of the SACOG projection data was not reconciled with 2010 Census data and was prepared at the beginning of the Great Recession. The projections did not build in the full extent of the downturn in employment or new housing growth experienced by the region and SACOG strongly discourages data users from using the 2020 forecast numbers and to instead use the 2035 forecast numbers. Therefore, the Orangevale growth rate used was a straight line extrapolated from the SACOG base year (2008) through 2035.

The growth rate used to project the District’s retail service area population is approximated by a weighted average of 75 percent with the Granite Bay Community Plan growth rate and 25 percent with the SACOG Orangevale growth rate. Population projections for the SJWD retail service area is summarized in Table 3-1a.

Table 3-1a: Retail: Population – Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040(opt)
	29,452	30,083	30,728	31,386	32,058	32,745
NOTES: 1. SJWD retail service area population for 2015 estimated using the DWR Population Tool and projected based on a weighted average of 75 percent Granite Bay Community Plan growth rate and 25 percent SACOG Orangevale growth rate.						

3.4.2 Wholesale Population

The District’s wholesale customer agencies provided population estimates for those areas receiving SJWD supply for the UWMP planning horizon. In 2015 the District’s wholesale service area population (including the District’s retail service area) was estimated to be about 151,500 (see Table 3-1b).

CHWD, FOWD, and OVWC provided population estimates for 2015 through 2035 for every five years, and their 2040 population was estimated by applying the respective 2030-2035 growth rate to the respective 2035 population. The City of Folsom provided population projections through 2040 for their Ashland service area, which is the only portion of the city receiving SJWD supply.

Table 3-1b: Wholesale: Population – Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040(opt)
	151,531	156,948	160,644	164,373	168,139	171,996
<p>NOTES:</p> <p>1. Population projections include SJWD retail, CHWD, FOWD, OVWC, and City of Folsom Ashland Service Area.</p> <p>2. SJWD retail service area population for 2015 estimated using the DWR Population Tool and projected based on a weighted average of 75 percent of the Granite Bay Community Plan growth rate and 25 percent of the SACOG Orangevale growth rate.</p> <p>3. Population projections were provided by CHWD, FOWD, OVWC, and the City of Folsom. 2040 population projections for CHWD, FOWD, and OVWC were not provided and were estimated for this UWMP by maintaining respective 2030-2035 growth rates through 2040.</p>						

3.4.3 Other Demographic Factors

CWC 10631

Describe the service area of the supplier, including...other demographic factors affecting the supplier's water management planning.

The District wholesale customer agencies and retail service areas fall within Sacramento and Placer Counties. Table 3-2 provides additional demographic information for these two counties.

Table 3-2: Retail and Wholesale: 2015 Demographics		
	Sacramento County	Placer County
Median Household Income	55,615	73,747
Average Household Size	2.74	2.67
Median Age	35.3	40.7
Unemployment Rate	6.0%	5.0%
<p>Sources:</p> <p>1. US Census Bureau, 2010-2014 American Community Survey 5-Year Estimates, http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml, accessed 3 March 2016</p> <p>2. California Employment Development Department, Labor Market Info Data Library, Report 400C Monthly Labor Force Data for Counties, Annual Average 2015-Revised. March 2016.</p>		

Chapter 4: System Water Use

As stated in Chapter 3, the District provides water service to customers in both their retail service area and to wholesale customer agencies. The wholesale customer agencies are the CHWD, FOWD, OVWC, and the City of Folsom. This chapter discusses District water use for its retail service area and for the total wholesale customer agencies' service area.

4.1 Recycled versus Potable and Raw Water Demand

The 2015 UWMP reports recycled, potable (drinking), and raw water demands separately. Recycled water is not currently available in SJWD's service area. Therefore, water demands reported in this chapter are for drinking and raw water only.

4.2 Water Uses by Sector

CWC 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) 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).*

Historical water sales data from 2000 to 2015 were analyzed in order to provide an overview of historical water usage trends for the District.

4.2.1 Historical Water Use

Wholesale Water Use

Figure 4-1 shows an overall decline in retail and wholesale total water use beginning in 2008. The recent decline in water use is not yet fully understood, but may be a result of several factors including changes in plumbing code, the economic downturn beginning in 2008 and the statewide drought beginning in 2014. The District's retail service area implemented voluntary 20 percent reductions in 2014 and mandatory 36 percent reduction in 2015 exceeding its requirement of 36 percent conservation (from 2013 demands) as mandated by the State Water Resources Control Board (SWRCB) in 2015.

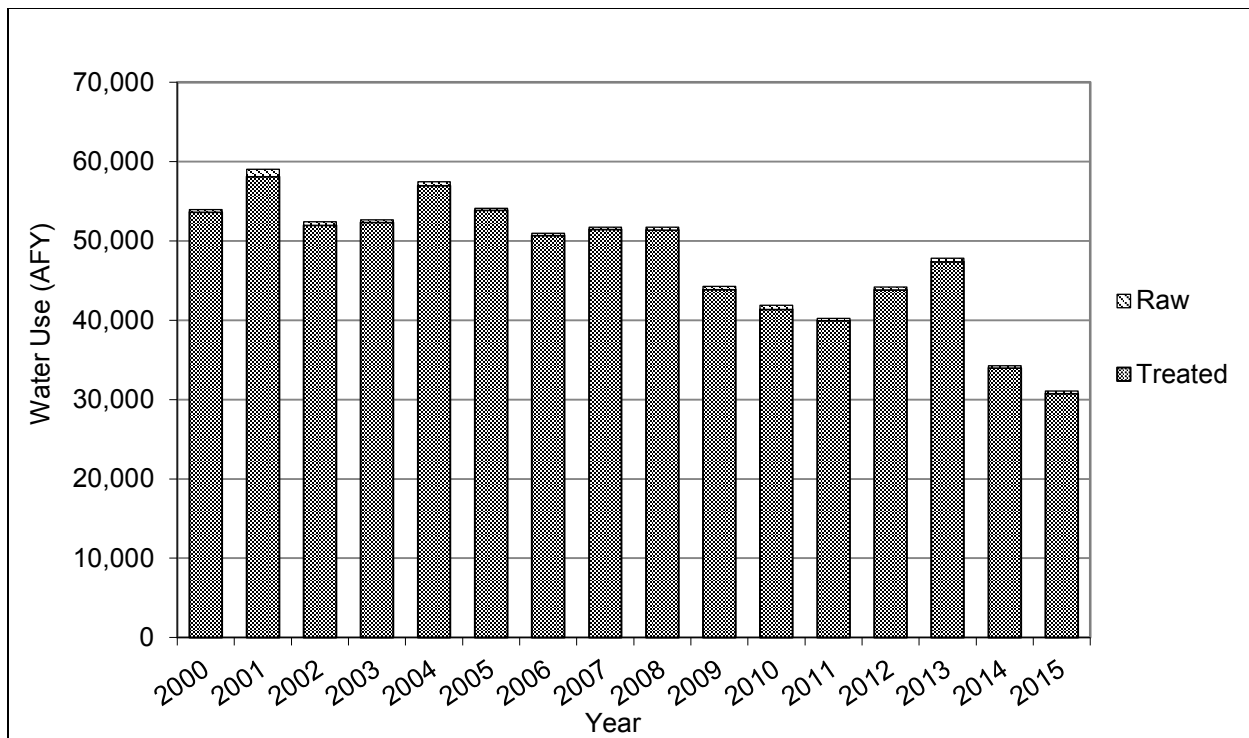


Figure 4-1: Historic Wholesale Water Use

Wholesale water sales fall into four DWR categories: 1) sales to other agencies, 2) other, 3) wetlands or wildlife habitat, and 4) losses.

Sales to other agencies include:

- Deliveries to SJWD's retail service area.
- Contract sales of treated water to the District's wholesale customer agencies (CHWD, FOWD, OVWC, and the City of Folsom).
- Contract sales of up to 4,000 AFY to the City of Roseville of treated water from the District's Placer County Water Agency (PCWA) supply is available when the unimpaired inflow to Folsom Reservoir is projected to be above 950,000 AFY.

Other wholesale water uses include:

- Process water at the District's Peterson Water Treatment Plant.
- Raw water sales to the Granite Bay Golf Course.

Water for wetlands or wildlife habitat includes treated environmental water to Baldwin Reservoir, a wetland habitat located in Granite Bay.

Wholesale water losses are estimated as the difference between the water entering the wholesale distribution system and the wholesale water delivered.

Table 4-1a presents the District's 2015 wholesale water demand separated into the relevant DWR categories, as well as the estimated 2015 water losses.

Table 4-1a: Wholesale: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description (as needed)	Level of Treatment When Delivered	Volume
Sales to other agencies	District's retail and wholesale customer agencies	Drinking Water	30,276
Sales to other agencies	City of Roseville Contract	Drinking Water	0
Wetlands or wildlife habitat	Baldwin Reservoir	Drinking Water	55
Other	Process Water	Raw Water	490
Other	Golf Course Irrigation	Raw Water	253
Losses	Wholesale + Baldwin Diversion + Process Water	Drinking Water	149
Losses	Golf Course Irrigation	Raw Water	1
TOTAL			31,223
<p>NOTES:</p> <ol style="list-style-type: none"> Units are in AFY. Demands include retail water use reductions as a result of the 36 percent conservation (compared to 2013) mandated by SWRCB. Sales to other agencies include drinking water deliveries to SJWD's retail service area and to the District's wholesale customer agencies and to the City of Roseville. 2015 water losses are preliminary and were estimated as total production minus metered uses, distributed according to the total portion of drinking water and raw water for 2015. Losses include system losses due to leaks, inaccurate meters, or other water used in operations such as system flushing and filter backwashing. 			

Supplies shown in Table 4-1a do not include water provided for mutual aid for the City of Roseville. The District can provide supply to the City of Roseville outside of their contract under mutual aid situations, such as when inflow into Folsom Reservoir is below 950,000 AFY. SJWD does not provide this supply unless requested for mutual aid.

In addition, the District is under contract with Sacramento Suburban Water District (SSWD) to provide treatment capacity, when available, for SSWD's contract water from PCWA. SSWD can only access their PCWA contract water from Folsom Reservoir during times when the unimpaired inflow to Folsom Reservoir is projected to be above 400,000 AF. Because this is not a demand of water supply from SJWD, this volume is not reflected in Table 4-1a.

Retail Water Use

Analysis of the District's retail water use shows the same trend in decreased water usage seen in the larger wholesale service area. The District's average per capita retail water use for 2000-2009 use decreased by over 18 percent for 2010-2013 due to extraordinary conservation efforts by SJWD to encourage customers to use water supply as efficiently as possible. The District's 2000-2009 average per acre retail water use of 1.24 AF per acre decreased to about 1.18 AF

per acre in 2010, similar to the statewide average of 1.16 AF per acre¹. Furthermore, the retail service area has also seen significant reductions in water use through the 2014 multiyear drought. The District's retail customers exceeded a voluntary 20 percent reduction in water usage in 2014 and the 36 percent reduction in water use mandated by the SWRCB in 2015.

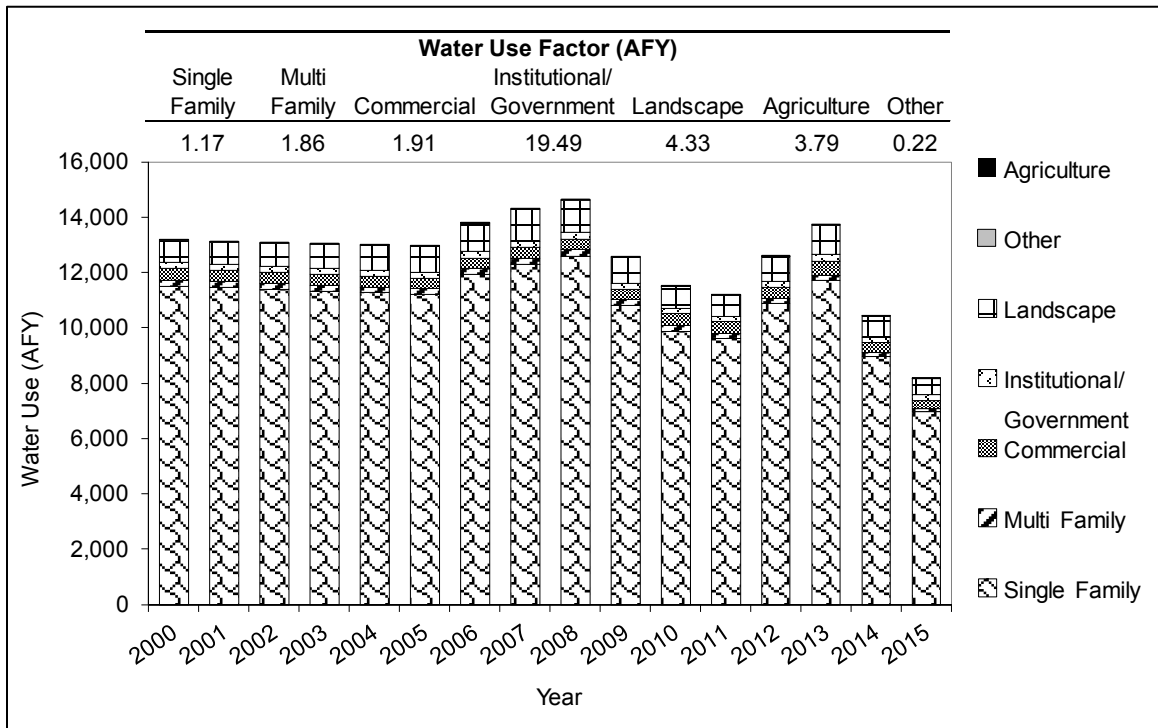
Retail water sales consist of treated water and fall into eight applicable DWR categories: single-family, multi-family, commercial, institutional/government, landscape, agriculture, losses, and other. Table 4-1b presents the District's 2015 retail water use separated into the relevant DWR categories, as well as the estimated 2015 water losses.

Table 4-1b: Retail: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description (as needed)	Level of Treatment When Delivered	Volume
Single Family		Drinking Water	6,952
Multi-Family		Drinking Water	132
Commercial		Drinking Water	298
Institutional/Governmental		Drinking Water	196
Landscape		Drinking Water	580
Other		Drinking Water	2
Losses		Drinking Water	1,481
Agricultural irrigation		Drinking Water	25
TOTAL			9,666
NOTES: 1. Units are in AFY. 2. Demands include retail water use reductions as a result of the 36 percent conservation as compared to 2013 mandated by SWRCB. 3. 2015 water losses are preliminary and were estimated as total production minus metered uses in 2015. Losses include system losses due to leaks, inaccurate meters or water used in operations such as system flushing.			

The average water use factor for each DWR category was calculated for the District's retail service area. For each analysis year, retail water use is divided by the number of retail water service connections by DWR category. The resulting value for each DWR category is the water use factor.

For the District's retail average water use factors, the period from 2000 through 2013 was considered representative of average retail water demand. Recent years 2014-2015 water use was considered atypical due to mandatory 36 percent conservation imposed by the Governor's drought emergency declarations. Figure 4-2 presents the historical retail water use from 2000 through 2015 and calculated water use factors (using 2000-2013) for each customer category.

¹ Based on a sample of 2010 UWMPs from each Hydrologic Region. Data compiled from 2010 Urban Water Management Plans and tables submitted to DWR by retail water suppliers:
http://www.water.ca.gov/urbanwatermanagement/2010_Urban_Water_Management_Plan_Data.cfm



Note: Water Use Factor is calculated using 2000-2013 historical retail water use.

Figure 4-2: Historic Retail Water Use and Water Use Factors by Category

4.2.2 Water Use Projections

Wholesale Projections

Water use projections for the District's wholesale service area were estimated based on:

- Normal year conditions (projected inflow to Folsom Reservoir is greater than 400,000 AFY);
- Water use projection estimates for the District's retail service area, presented in the next section;
- Water use projections provided by the District's wholesale customer agencies: OVWC, CHWD, City of Folsom, and FOWD;
- 4,000 AF demand for the City of Roseville;
- Historical average water uses for Baldwin Reservoir, District process water, and losses.

Projections do not include water provided to the City of Roseville or SSWD for mutual aid or treatment and/or conveyance of SSWD water supply from their PCWA water supply contract.

In addition, the District is identifying potential opportunities for a conjunctive use program within the wholesale service area or within the region. This program is still in its developmental stages. At this time, the District assumes all surface water not used by its retail area or its wholesale

customer agencies will be used in the conjunctive use program. The District assumes the program will begin in 2020 and reach full potential in 2040.

Table 4-2a presents the projected growth in wholesale water demand for the period 2020 through 2040 in 5-year increments.

Table 4-2a: Wholesale: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description (as needed)	Projected Water Use <i>Report To the Extent that Records are Available</i>				
		2020	2025	2030	2035	2040 (opt)
Sales to other agencies	Wholesale	48,453	50,184	51,839	53,553	55,287
Sales to other agencies	City of Roseville	4,000	4,000	4,000	4,000	4,000
Wetlands or wildlife habitat	Baldwin Reservoir	46	46	46	46	46
Other	Process Water	322	322	322	322	322
Other	Golf Course Irrigation	282	282	282	282	282
Other	Conjunctive Use	4,177	8,353	12,530	16,707	20,884
Losses	Wholesale + Baldwin Diversion + Process Water	1,204	1,247	1,288	1,330	1,373
Losses	Golf Course Irrigation	7	7	7	7	7
TOTAL		58,490	64,441	70,314	76,246	82,200

NOTES:

- Units are in AFY.
- Projections assume Normal year conditions (projected inflow to Folsom Reservoir is greater than 950,000 AFY).
- Sales to other agencies includes deliveries to wholesale customer agencies, SJWD retail service area demands, and 4,000 AF demand for the City of Roseville.
- Wholesale customer agency demands were provided by CHWD, FOWD, OVWC, and the City of Folsom Ashland Service Area. CHWD, FOWD, and OVWC water demand projections for 2040 were not provided and were estimated for this UWMP by maintaining respective 2030-2035 demand growth rates. CHWD and OVWC demands include SBX7-7 water conservation target water use.
- Projected golf course irrigation, releases to Baldwin Reservoir and process water are based on historical average uses.
- Conjunctive use is projected to begin in 2020 with incremental increases in use, reaching full implementation in 2040.
- Losses are estimated based on historic estimated losses (total production minus metered demands) averaging about two percent of production.

Retail Projections

To calculate the District's projected retail water service connections for the period 2020 through 2040 in 5-year increments, two different growth rates were analyzed: 1) SACOG-based growth, and 2) historical-trend growth.

1. SACOG-based growth rate:

The SACOG-based growth rates were calculated similar to the population growth rate presented in Chapter 3.4, based on the 2012 Granite Bay Community Plan and SACOG (Orangevale) growth rates from 2008-2035. Similar to the retail population projections, it was determined that the District's retail service area can be represented by Granite Bay (75 percent) and Orangevale (25 percent).

Growth rates for the District's single family and multi-family connections are based on the Granite Bay Community Plan and SACOG (Orangevale) household growth rates. Growth rates for the District's retail commercial, industrial, institutional/government, and landscape service connections are based on the Granite Bay Community Plan and SACOG (Orangevale) employment growth rates.

2. Historical-trend growth rate:

A best-fit trend line was calculated for the historical number of District retail service connections from 2000 through 2015. The slope of the resulting trend line is the projected growth rate of the retail service connections. This method applies the same growth rate to every water service connection category.

Figure 4-3 shows the District's historical total retail water service connections from 2000 through 2015 and the projected total retail water service connections from 2020 through 2040 employing the SACOG-based and historical-trend growth rates. As shown in Figure 4-3, the historical-trend growth rate is greater than the SACOG-based growth rate. This is due to the fact that Granite Bay Community Plan's projected growth rates are slower than the actual growth rates experienced within the District's retail service area over the past 20 years. The District has opted to use the historical trend projections for future retail water demand estimates as using these more conservative numbers will ensure that the District will have sufficient water supply to meet future demand.

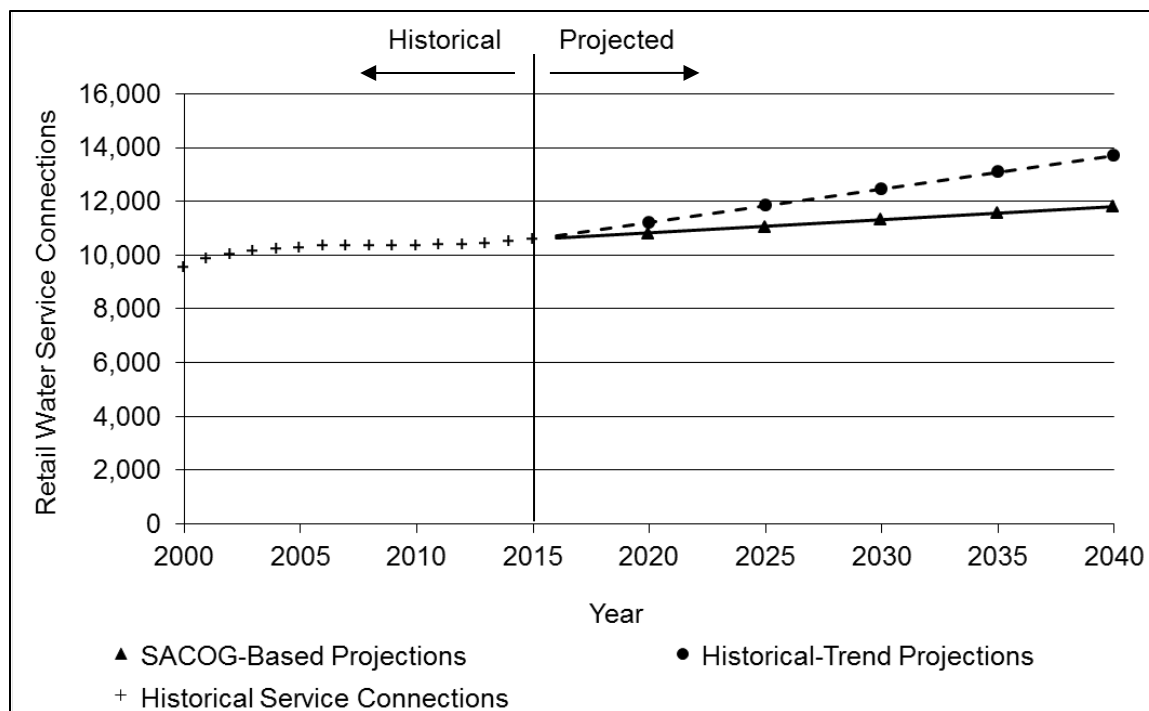


Figure 4-3: Historical and Projected Retail Water Use

The range established between the SACOG-based projection and the historical-trend projection is intended as supplemental information; all recommendations are based on the historical trend projection, which are higher and provide a more conservative estimate of future growth. The SACOG-based projection is provided as ancillary information only and presents a projection range reflecting the inherent uncertainty in growth trends.

The projected water use for the District’s retail service area was calculated by applying the corresponding water use factors presented in Section 4.2.2 to the projected number of retail service connections in each DWR category. These projections do not include the SBX7-7 target water demands described in Chapter 5. Table 4-2b summarizes the projected retail water demand through the year 2040 based on the historical-trend growth rate.

Table 4-2b: Retail: Demands for Potable and Raw Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use <i>Report To the Extent that Records are Available</i>				
		2020	2025	2030	2035	2040-opt
Single Family		12,351	13,040	13,729	14,418	15,107
Multi-Family		235	248	261	274	287
Commercial		491	549	545	573	600
Institutional/Governmental		227	240	252	265	278
Landscape		969	1,023	1,077	1,131	1,185
Other		2	2	2	2	2
Losses		1,561	1,652	1,735	1,823	1,910
Agricultural irrigation		20	21	22	23	25
TOTAL		15,855	16,773	17,624	18,509	19,393

NOTES:

1. Units are in AFY.
2. Projections assume Normal year conditions (inflow to Folsom Reservoir is greater than 950,000 AFY).
3. Projections do not include SBX7-7 target water demands.
4. Losses are estimated based on historic estimated losses (total District supply entering the retail distribution system minus metered retail demands) averaging about ten percent of water supplied to the retail service area.

4.2.2.1 Total Water Demand Projections

Tables 4-3a and 4-3b present the total current (2015) and projected water demands for the District's wholesale and retail service areas through 2040.

Table 4-3a: Wholesale: Total Water Demands

	2015	2020	2025	2030	2035	2040 (opt)
Potable and Raw Water <i>From Tables 4-1 and 4-2</i>	31,223	58,490	64,441	70,314	76,246	82,200
Recycled Water Demand <i>From Table 6-4</i>	0	0	0	0	0	0
TOTAL WATER DEMAND	31,223	58,490	64,441	70,314	76,246	82,200

NOTES:

1. Units are in AFY.
2. See Table 4-2a for a detailed breakdown of SJWD Wholesale Service Area demand.

Table 4-3b: Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040 (opt)
Potable and Raw Water <i>From Tables 4-1 and 4-2</i>	9,666	15,855	16,773	17,624	18,509	19,393
Recycled Water Demand <i>From Table 6-4</i>	0	0	0	0	0	0
TOTAL WATER DEMAND	9,666	15,855	16,773	17,624	18,509	19,393
NOTES: 1. Projected demands in units of AFY. 2. See Table 4-2b for a detailed breakdown of water demands for the SJWD Retail Service Area.						

4.3 Distribution System Water Losses

CWC 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:...*

(J) *Distribution system water loss*

(3)(A) *For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.*

(B) *The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.*

System losses must be incorporated when projecting total water demand. System losses (also known as non-revenue water) are defined as the difference between water entering the distribution system (or total production) and metered uses and sales. Included are system losses due to leaks, or inaccurate meters, and other water used in operations such as system flushing and filter backwashing.

Beginning with the 2015 UWMPs, water retailers must report distribution system loss based on the American Water Works Association's Water (AWWA) Audit Software (version 5.0). This analysis was completed for 2014 (see Tables 4-4a, 4-4b, and Appendix D). Water losses presented for 2015 in Tables 4-2a and 4-2b are estimates based on total production minus metered demands, and have not been analyzed using the Water Audit Software.

Table 4-4a: Wholesale: Water Loss Summary Most Recent 12 Month Period Available	
Reporting Period Start Date	Volume of Water Loss
01/2014	700
NOTES: 1. Units are in AFY. 2. This volume was analyzed using the AWWA Water Audit Software (Version 5.0) for January 2014 through December 2014. 2015 data was not available for this analysis prior to preparation of the 2015 SJWD UWMP.	

Table 4-4b: Retail: Water Loss Summary Most Recent 12 Month Period Available	
Reporting Period Start Date	Volume of Water Loss
01/2014	553
NOTES: 1. Units are in AFY. 2. This volume was analyzed using the AWWA Water Audit Software (Version 5.0) for January 2014 through December 2014. 2015 data was not available for this analysis prior to preparation of the 2015 SJWD UWMP.	

4.4 Water Use for Lower Income Households

CWC 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.*

California Health and Safety Code 50079.5

(a) *“Lower income households” means persons and families whose income does not exceed the qualifying limits for lower income families... In the event the federal standards are discontinued, the department shall, by regulation, establish income limits for lower income households for all geographic areas of the state at 80 percent of area median income, adjusted for family size and revised annually.*

Senate Bill 1087 requires that water use projections of a UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the General Plan Housing Element of any city and county in the service area of the supplier (see Table 4-5).

Table 4-5: Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	No
If "Yes" to above, state the section or page number where citations of the codes, ordinances, etc... utilized in demand projections are found.	Location in UWMP _____
Demands Included In Projections? Drop down list (y/n)	Yes
NOTES:	

The state-mandated Regional Housing Needs Allocation (RHNA) process requires that cities and counties develop a methodology that determines the number of housing units that each jurisdiction must zone for when updating its housing element. General Plan Housing Elements rely on the RHNA generated by the State Department of Housing and Community Development (HCD) to allocate the regional need for housing to the regional Council of Governments (COG) (or a HCD for cities and counties not covered by a COG) for incorporation into housing element updates. Before the housing element is due, the HCD determines the total regional housing need for the next planning period for each region in the state and allocates that need. The COGs then allocate to each local jurisdiction its “fair share” of the RHNA, broken down by income categories; very low, low, moderate, and above moderate, over the housing element’s planning period.

According to the City of Folsom 2013 General Plan Housing Element Update, the total housing requirement is 4,633 units for the City of Folsom. The Placer County General Plan Housing Element 2013-2021 estimates that the County will require 5,031 housing units. The Sacramento County General Plan Housing Element 2013-2021 shows a total housing requirement of 13,844 units. According to the SACOG Regional Housing Needs Plan projections, the District can expect a potential for 12% affordable housing for low to moderate-income families to be developed in its retail service area by 2030. Therefore, the total of low- and very low-income housing need of 12 percent was used to estimate demand projections as shown in Table 4-6 below.

Table 4-6: Retail Only: Low-Income Projected Water Demands					
	2020	2025	2030	2035	2040
Single Family Residence	648	730	813	896	979
Multi Family Residence	12	14	15	17	19
Total	660	744	829	913	997
NOTES: 1. Units are in AFY. 2. Based on the SACOG Regional Housing Needs Plan, 12 percent of households will be low- and very-low income. Therefore, low-income water demand projections are 12 percent of single family and multi-family projected water demand.					

San Juan Water District will not deny or conditionally approve water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households unless one of the following occurs:

- The District specifically finds that it does not have sufficient water supply.
- The District is subject to a compliance order issued by the State Department of Public Health that prohibits new water connections.
- The applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

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Chapter 5: SBX7-7 Baselines and Targets

The Water Conservation Bill of 2009 (SBX7-7) is one of four policy bills enacted as part of the November 2009 Comprehensive Water Package (Special Session Policy Bills and Bond Summary). The Water Conservation Bill of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the *20 x 2020 Water Conservation Plan*. Consistent with SBX7-7, each water supplier must determine and report its existing baseline water consumption and establish water use targets in gallons per capita per day (GPCD), and compare actual water use against the target; reporting began with the 2010 UWMP.

In the 2015 UWMP, retail water agencies must demonstrate compliance with the interim target established for 2015 and demonstrate that the agency is on track to achieve its 2020 target. Compliance is done through completion of the DWR SBX7-7 Verification Tables submitted as Appendix E of the 2015 UWMP.

SBX7-7 baselines and target calculations are for the District's retail water service area only.

5.1 Guidance for Wholesale Agencies

For purposes of identifying baselines and targets, the following definition applies:

CWC 10608.12

(r) *"Urban wholesale water supplier" means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.*

CWC 10608.36

Urban wholesale water suppliers shall include in the urban water management plans... an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

The District supplies wholesale water to five retail systems: Citrus Heights Water District, Fair Oaks Water District, Orange Vale Water Company, the City of Folsom, and the District's retail service area. The District will utilize current and projected water demands from its wholesale customers in an assessment of the District's present and proposed future measures, programs and policies that will help their wholesale customers achieve their individual SBX7-7 water use reduction targets. Chapter 9 discusses demand management measures currently in place and those planned for implementation.

5.2 Updating Calculations from 2010 UWMP

CWC 10608.20

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

Methodologies DWR 2011, Methodology 2 Service Area Population

Page 27 - Water suppliers may revise population estimates for baseline years between 2000 and 2010 when 2010 census information becomes available. DWR will examine discrepancy between the actual population estimate and DOF's projections for 2010; if significant discrepancies are discovered, DWR may require some or all suppliers to update their baseline population estimates.

The District first reported its Baseline Daily Per Capita Water Use (Baseline GPCD) in its 2010 UWMP; however, at the time the 2010 UWMP was prepared, complete 2010 Census data was not available. Therefore, for the 2015 UWMP, the District is required to recalculate baseline and target water use using 2010 Census data. The following sections summarize the revised calculations, which are included in Appendix E.

5.3 Baseline Periods

CWC 10608.20

- (e) *An urban retail water supplier shall include in its urban water management plan due in 2010. . . the baseline daily per capita water use...along with the bases for determining those estimates, including references to supporting data.*
- (g) *An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*

Two water use baselines must be calculated prior to establishing target conservation water use. The first baseline is the average gross water use for a continuous period ending no earlier than December 31, 2004 and ending no later than December 31, 2010. This default baseline period is 10 years. If at least ten percent of the 2008 gross water use was met by recycled water, then this baseline period may be extended to include an additional 5 years. The District did not use recycled water in 2008, therefore the first baseline period for the District is 10 years from 1999 to 2008.

The second baseline must be the average gross water use for a continuous 5-year period ending no earlier than December 31, 2007 and no later than December 31, 2010. The SJWD 5-year baseline is from 2003 to 2007.

5.4 Service Area Population

CWC 10608.20

- (e) *An urban retail water supplier shall include in its urban water management plan due in 2010...the baseline per capita water use,...along with the bases for determining those estimates, including references to supporting data.*
- (f) *When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.*

CWC10644

- (a)(2) *The plan...shall include any standardized forms, tables or displays specified by the department.*

In order to calculate Base Daily Per Capita Water Use for past years, it was necessary to develop population estimates for past years. The population for the District was calculated for 2010 and 2015 using the DWR online population tool. This was accomplished using a Geographic Information System (GIS) interface to derive population. By adding shape files for the service area boundaries or public water system boundary in 2010, population is derived using U.S. Census Bureau census tract data from that census year. Then, along with District production and service connections, the DWR population tool derives a persons-per-connection number, which is used to determine population in the intervening years between 1990 and 2010.

The population for the baseline period used for calculating the Base Daily Water Use can be found in SBX7-7 Verification Table 3 in Appendix F.

5.5 Gross Water Use

CWC 10608.12

- (g) *“Gross Water Use” means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:*
 - (1) *Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier*
 - (2) *The net volume of water that the urban retail water supplier places into long term storage*
 - (3) *The volume of water the urban retail water supplier conveys for use by another urban water supplier*
 - (4) *The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.*

California Code of Regulations Title 23 Division 2 Chapter 5.1 Article

Section 596 (a) An urban retail water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector.

The Base Daily Water Use calculation is based on gross water use by an agency in each year and can be based on a ten-year average ending no earlier than 2004 and no later than 2010, or a 15-year average if ten percent of 2008 demand was met by recycled water. Base Daily Water Use must account for all water sent to retail customers, excluding:

- Recycled water
- Water sent to another water agency
- Water that went into storage

It is at an agency's discretion whether or not to exclude agricultural water use from the Base Daily Water Use Calculation. If agricultural water use is excluded from the Base Daily Water Use calculation it must also be excluded from the calculation of actual water use in later urban water management plans. The District did not supply water to agriculture during the period 1995 to 2010 and so agricultural water does not factor into the District's SBX7-7 calculations.

5.6 Baseline Daily per Capita Water Use

Daily per capita water use is calculated for each year within the baseline periods in Section 5.3 using the retail service area population in Section 5.4 and gross retail water use in Section 5.5. For the 2015 San Juan Water District UWMP the calculated Base Daily Water Use are:

- 10-year average (1999-2008): 516 GPCD
- 5-year average (2003-2007): 517 GPCD

The 10-year and 5-year Base Daily Water Use calculations are presented in SBX7-7 Verification Table 5 in Appendix E.

5.7 2015 and 2020 Targets

CWC 10608.20

(e) An urban retail water supplier shall include in its urban water management plan due in 2010. . . urban water use target, interim urban water use target, . . . along with the bases for determining those estimates, including references to supporting data (10608.20(e)).

CWC 10608.20

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan.

An urban retail water supplier must set a 2020 water use target (herein called the Compliance Water Use Target) and a 2015 interim target (herein called the Interim Water Use Target). There are four methods for calculating the Compliance Water Use Target:

1. Eighty percent of the urban water supplier's Base Daily Water Use.
2. Per capita daily water use estimated using the sum of the following:
 - a. For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of DWR's 2016 report to the Legislature reviewing progress toward achieving the statewide 20 percent reduction target, this standard may be adjusted by the Legislature by statute.

- b. For landscape irrigated through dedicated or residential meters or connections, water use efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in section 490 et seq. of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992.
 - c. For commercial, industrial, and institutional (CII) uses, a ten percent reduction in water use from the baseline commercial, industrial, and institutional/government water use by 2020.
3. Ninety-five percent of the applicable state hydrologic region target as stated in the state's April 30, 2009, draft 20 by 2020 Water Conservation Plan. The District falls within the Sacramento River Region (target for this region is 176 GPCD).
 4. Reduce the 10 or 15-year Base Daily Per Capita Water Use a specific amount for different water sectors:
 - a. Indoor residential water use to be reduced by 15 GPCD or an amount determined by use of DWR's "BMP Calculator".
 - b. A 20 percent savings on all unmetered uses.
 - c. A 10 percent savings on baseline CII use.
 - d. A 21.6 percent savings on current landscape and water loss uses.

The District's 2010 UWMP used Compliance Method 1 to set the Compliance Water Use Target. For the 2015 UWMP, the District will not change its selected compliance methodology and continue to use Compliance Method 1 with a 2020 target of 413 GPCD.

5.7.1 5-Year Baseline – 2020 Target Confirmation

CWC 10608.22

Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

The selected Compliance Water Use Target must be compared against what DWR calls the "Maximum Allowable GPCD". The Maximum Allowable GPCD is based on 95 percent of a 5-year average base gross water use ending no earlier than 2007 and no later than 2010. The Maximum Allowable GPCD use is used to determine whether a supplier's 2015 and 2020 per capita water use targets meet the minimum water use reduction of the SBX7-7 legislation. If an agency's Compliance Water Use Target is higher than the Maximum Allowable GPCD, the agency must instead use the Maximum Allowable GPCD as its target.

The minimum retail water use reduction compliance target is calculated as 95 percent of the 5-year Baseline GPCD, or 492 GPCD, which is above the selected compliance target of 413 GPCD. Therefore, the Compliance Water Use Target for the District is 413 GPCD (see SBX7-7 Verification Table 7-F in Appendix E).

5.7.2 Baselines and Targets Summary

The interim and Compliance Water Use Target are provided per Section 10608.20(e) of the Act. Table 5-1 summarizes the SBX7-7 baselines calculations.

Table 5-1: Baselines Calculations				
Year		Service Area Population	Gross Water Use (GPD)	Daily Per Capita Water Use
10 to 15 Year Baseline GPCD				
1	1999	26,087	14,182	485
2	2000	26,711	14,287	477
3	2001	27,567	16,192	524
4	2002	28,045	17,361	553
5	2003	28,287	17,102	540
6	2004	28,570	17,941	561
7	2005	28,742	16,125	501
8	2006	28,791	15,133	469
9	2007	28,756	16,659	517
10	2008	28,779	17,063	529
10 Year Average Baseline GPCD				516
5 Year Baseline GPCD				
Year		Service Area Population	Gross Water Use (GPD)	Daily Per Capita Water Use
1	2003	28,287	17,102	540
2	2004	28,570	17,941	561
3	2005	28,742	16,125	501
4	2006	28,809	15,133	469
5	2007	28,756	16,659	517
5 Year Average Baseline GPCD				517
2015 Compliance Year GPCD				
2015		29,452	9,273	293
Note:				
1. This table is based on DWR SBX7-7 Table 5, also provided in Appendix E.				
2. 2015 water use includes 36 percent conservation (compared to 2013) as mandated by the SWRCB.				

Table 5-2 shows the Compliance Water Use Target for the District is 413 GPCD. The Interim Water Use Target for 2015 is set as a halfway point between the Base Daily Water Use GPCD and the 2020 Compliance Water Use Target GPCD and is 464 GPCD. The implementation plan for achieving the targets is described in Chapter 9, Demand Management Measures.

Table 5-2: Baselines and Targets Summary					
Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	1999	2008	516	464	413
5 Year	2003	2007	517		
*All values are in Gallons per Capita per Day (GPCD)					
NOTES:					
1. Based on DWR Table 5-1.					

5.8 2015 Compliance Daily per Capita Water Use (GPCD)

<p>CWC 10608.12</p> <p>(e) <i>“Compliance daily per-capita water use” means the gross water use during the final year of the reporting period...</i></p> <p>CWC 10608.24</p> <p>(a) <i>Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.</i></p> <p>CWC 10608.20</p> <p>(e) <i>An urban retail water supplier shall include in its urban water management plan due in 2010 . . . compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.</i></p>
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The District’s 2015 GPCD was calculated by using the DWR population tool. Once population was derived from 2010, 2015 could be extrapolated by using the 2010 persons-per-connections. With 2015 production and connection data, a supplier can then calculate their 2015 consumption to determine if they have met their 2015 interim target. The District’s retail water use in 2015 was 293 GPCD, satisfying the SBX7-7 2015 interim target of 464 GPCD.

The SJWD Water Use Reduction Plan was developed to increase the level of retail water conservation to achieve the State’s goal of a 20% reduction in per-capita water use by 2020. The District implements all of the water conservation components identified in the California Urban Water Conservation Council’s Memorandum of Understanding (MOU) for Best Management Practices (BMPs). As a result of these efforts, the District’s average per capita retail water use for 2000-2009 use decreased by over 18 percent for 2010-2013, and even greater savings in 2014 and 2015 in response to voluntary District programs and mandatory Statewide conservation requirements.

The District will continue to implement its conservation program as presented in Chapter 9 and plans to meet its 2020 target through these programs. The District’s continued commitment to comply with the Council MOU and implementation of additional demand management measures (DMMs) are expected to provide sufficient water savings to meet the 2020 target water use.

5.8.1 2015 Adjustments of 2015 Gross Water Use

CWC 10608.24

- (d)(1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:
- (A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.
 - (B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.
 - (C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.
 - (2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

Methodology Document, Methodology 4

This section discusses adjustments to compliance-year GPCD because of changes in distribution area caused by mergers, annexation, and other scenarios that occur between the baseline and compliance years.

The SJWD System gross water use for 2015 achieves the calculated interim target of 464 GPCD with a 2015 actual retail water use of 293 GPCD. No adjustments are being made to the 2015 retail water use for the District (see Table 5-3).

Table 5-3: Retail: 2015 Compliance					
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments to 2015 GPCD Enter "0" for adjustments not used		2015 GPCD (Adjusted if applicable)	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		TOTAL Adjustments	Adjusted 2015 GPCD		
293	464	0	293	293	Yes
*All values are in Gallons per Capita per Day (GPCD)					
NOTES:					
1. This Table based on DWR Table 5-2.					

Chapter 6: System Supplies

The District provides treated surface water to both its retail service area and wholesale customer agencies. The District's water supply right and contracts total 82,200 AFY of surface water from the American River.

Water supply for the District is surface water from Folsom Lake, which is fed from the North and South Forks of the American River. Water is delivered from Folsom Lake to the Sidney N. Peterson Water Treatment Plant, which has a treatment capacity of 150 million gallons per day (MGD). The treated water is sent to Hinkle Reservoir, which has a capacity of 62 million gallons (MG) (190 AF). The reservoir provides capacity for peaking and emergencies in excess of treatment plant production.

6.1 Purchased or Imported Water

The District has its own water rights and contracts with USBR and Placer County Water Agency for American River water with delivery from Folsom Lake. These surface water contracts and supplies are discussed in detail in Chapter 6.3. The District does not import water from other regions.

6.2 Groundwater

The District does not have access to groundwater within its retail service area boundaries. Two of the District's wholesale customer agencies (Fair Oaks Water District and Citrus Heights Water District) currently have groundwater resources available to supplement surface water from the District when needed due to reduced surface water supplies or emergency situations. Each wholesale customer agency is completing an UWMP that will provide more in-depth discussion of each agency's groundwater supplies and operations independent of this document.

The District signed an agreement on June 23, 2015 with the Sacramento Suburban Water District to share ownership, operation, and maintenance of the Antelope Booster Pump-Back Station (Station). The Station is intended to provide groundwater supplies to the District during dry years or times of limited surface water availability from Folsom Lake, as well as during planned or unplanned outages of surface water transmission or treatment systems. The Station's two pumps have a combined pumping capacity of 10,000 gallons per minute (GPM). It is estimated that the Station could be operated at full capacity July through September and about half capacity in June and October, if needed during dry years. To date, the District has not received any water from SSWD through this pump station other than incidental testing during construction. Further description how this program affects water supply reliability is provided in Section 7.1.2.

6.2.1 Basin Description

CWC 10631

(b) 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:

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.

The groundwater basin underlying the region is located in the North American Subbasin, which is part of the larger Sacramento Valley Groundwater Basin. According to DWR Bulletin 118 (DWR, 2003), the North American Subbasin Basin Number is 5-21.64. The North American subbasin comprises approximately 350,000 acres. The Sacramento Valley Groundwater Basin is not adjudicated. The basin is not identified by DWR Bulletin 118 as being in overdraft.

The water-bearing deposits underlying the District, its wholesale customer agencies, and SSWD include the Fair Oaks and Mehrten Formations. The Mehrten Formation is the most productive fresh water-bearing unit in the eastern Sacramento Valley, though some of the permeable layers of the Fair Oaks Formation produce moderate amounts of water.

6.2.2 Groundwater Management

CWC 10631

(b) ...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... or any other specific authorization for groundwater management.*
- (2) ...For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.*

The Sacramento Groundwater Authority (SGA) adopted its revised groundwater management plan in December 2014. The District is a participating agency in SGA. The authority to prepare a plan is granted to SGA through the Joint Powers Agreement (JPA) executed between the County of Sacramento and the cities of Citrus Heights, Folsom, and the City of Sacramento. The plan was originally prepared in compliance with Water Code Section 10753.7 resulting from the passage of SB 1938 in 2002.

The estimated average annual sustainable yield recommendation for the North sub-area of the County of Sacramento, as defined by the Water Forum, is 131,000 AFY (EDAW/SWRI, October 1999), but the basin is not adjudicated. Recent groundwater pumping has remained below the 131,000 af level.

The Sacramento Valley Groundwater Basin is not adjudicated. However, under the Sustainable Groundwater Management Act of 2014 (SGMA) the assigned basin priority is medium/high, and therefore a groundwater sustainability plan must be adopted for the Sacramento Valley Groundwater Basin. As a result, there may be future changes to the management of the basin, the impacts of which cannot be forecast at this time. SJWD intends to participate in the implementation of the SGMA in the Sacramento Valley Groundwater Basin as appropriate.

6.2.3 Overdraft Conditions

CWC 10631

(b)(2) *For basins that have not been adjudicated, (provide) 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.*

The Sacramento Valley Groundwater Basin is not identified by DWR Bulletin 118 as being in overdraft. Groundwater elevation levels were generally declining in Sacramento County for 40 years, until 1996. Since 1996, increased conjunctive use efforts in the Sacramento Valley Region have slowed or eliminated the groundwater elevation decrease. In some areas, the groundwater levels have increased during this period. Water levels have not varied greatly over time due to the limited use of groundwater in the area (SGA Groundwater Management Plan, 2014). Wells located within the SJWD Wholesale service area have generally demonstrated small changes in water levels throughout the last 50 years, with some wells showing increased water levels in the last 10 years.

6.2.4 Historical Groundwater Pumping

CWC 10631

(b)...*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:*

(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.*

As stated at the beginning of this Section, the District does not pump groundwater. Therefore, Table 6-1 will not be completed.

Table 6-1: Retail and Wholesale: Groundwater Volume Pumped						
<input checked="" type="checkbox"/>	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
TOTAL		0	0	0	0	0
NOTES:						

6.3 Surface Water

Water is delivered from Folsom Lake to the Sidney N. Peterson Water Treatment Plant with treated water sent to Hinkle Reservoir. This local surface water source will continue to be treated to drinking water standards, and no water quality issues are foreseen to impact this supply over the next 25 years. The District's surface water supply comes from the pre-1914 rights and contracts described below.

Pre-1914 Rights

SJWD acquired 26,400 AFY of pre-1914 rights water and an appropriative water right with a priority date of February 11, 1928 for 6,600 AFY, both off the north fork of the American River, as part of the purchase of the North Fork Ditch Company in 1954. SJWD entered into an agreement with USBR, during the construction of Folsom Dam, for USBR to deliver the entire 33,000 AF under a no shortage provision. SJWD retained the water rights at the time of the construction of Folsom Dam, which flooded the previous diversion point for these water rights. The delivery of this 33,000 AF is limited to a rate of 75 CFS from the American river, delivered from Folsom Reservoir by USBR.

USBR CVP Folsom Lake Contract

In 1962 SJWD negotiated with the United States Bureau of Reclamation (USBR) for 40,000 AFY of contract water to provide for immediate and future needs. In the late 1960s, the USBR worked out a mathematical formula for the District's future needs and reduced the contract amount from 40,000 AFY to 11,200 AFY. Immediately following the cutback, the District Board of Directors (Board) requested USBR reinstate the original 40,000 AFY. To date, the District has not had the original 40,000 AFY reinstated.

The District contracted with USBR for 13,000 AFY of American River water for delivery from Folsom Lake as authorized by PL 101-514 (often referred to as "Fazio Water", named after Congressman Vic Fazio). In 2006, the 11,200 AFY and 13,000 AFY USBR contracts were combined for a total of 24,200 AFY. USBR recently adopted a shortage policy for Central Valley Project (CVP) water supplies. In general, municipal and industrial (M&I) water supplies can be reduced during dry years to 75 percent of total supplies. Should hydrology result in severely limited water supplies, M&I can be reduced down to health and safety levels but only after agricultural contracts have been reduced to 0 percent allocations.

PCWA Contract

In 1972, the District Board successfully negotiated a contract with PCWA for additional water supply. This contract extends through 2021 and is renewable for 20-year periods. It provides for water to be supplied to the District in increasing amounts from 5,000 AFY that began in 1977 to 25,000 AFY in the year 1992 and every year thereafter. The PCWA contract places a first priority on use in Placer County, but allows use of any water not needed in Placer County to be used in Sacramento County. SJWD use of PCWA water is currently limited to the Placer County area of our service area by our contract to use federal facilities to transmit PCWA water through Folsom Reservoir and associated facilities. The District is currently evaluating eliminating this constraint on the use of PCWA water.

Based on current Update Reports to the Watershed Sanitary Surveys, the American River is an excellent supply for drinking water in the Sacramento Metropolitan Area. The source water is treated to meet all Title 22 drinking water standards using conventional and direct filtration

processes. There are no persistent constituents in the raw water that require additional treatment processes for non-potable uses such as gold course irrigation.

6.4 Stormwater

The County of Sacramento Department of Water Resources operates and maintains the stormwater collection and drainage system within the urban and unincorporated areas of Sacramento County. Likewise, Placer County Flood Control and Water Conservation District manages major drainage facilities, stream channels, and detention and retention basins, as well as stormwater quality for Placer County.

At this time, there is no existing infrastructure within the District service area for beneficial use of a stormwater management system.

6.5 Wastewater and Recycled Water

The following section describes the estimated wastewater generated in the District's retail service area. Although some areas are on septic, for the purposes of the UWMP, wastewater collected by septic systems is not included. The wastewater is collected and conveyed out of the District's retail and wholesale service area to either the Sacramento Regional County Sanitation District's (Regional San's) wastewater treatment plant or one of the City of Roseville's wastewater treatment plants.

6.5.1 Recycled Water Coordination

CWC 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.

Regional San is one of the agencies responsible for collecting, treating, and discharging wastewater in the greater Sacramento region. Most of the local water agencies coordinate with Regional San regarding various matters such as conservation methodologies and rebates, recycled water use potential, and other issues. Recycled water produced by Regional San is currently used outside the SJWD retail and wholesale service areas.

The City of Roseville is responsible for collecting treating, and discharging treated wastewater within its boundaries. Recycled water produced by the City of Roseville is currently used outside of the SJWD retail and wholesale service areas.

The District has no authority or control over municipal wastewater generated in the District's wholesale or retail service areas. The District also currently has no authority for recycled water use in its area, and there is currently no reuse water available in its service area. However, the local water purveyors understand that recycled water use will become an important element of integrated regional water supply planning, and support the development of a reuse supply component.

6.5.2 Wastewater Collection, Treatment, and Disposal

CWC 10633

- (a) *(Describe) 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.*

CWC 10633

- (b) *(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

Municipal wastewater is generated in the District's retail service area from a combination of residential and commercial sources. The quantities of wastewater generated are proportional to the population and the water use in the service area. Estimates of the wastewater flows collected within the District's service area are presented in Table 6-2.

The City of Roseville owns and operates two wastewater treatment plants, the Dry Creek Wastewater Treatment Plant (DCWWTP) and the Pleasant Grove Wastewater Treatment Plant (PGWWTP), both located outside the District's retail and wholesale service areas. All the wastewater generated within the District's service area in Placer County is treated at the DCWWTP. The DCWWTP can provide tertiary wastewater treatment of 28 MGD or about 31,000 AFY. In total, the City of Roseville delivers about 619 MG of recycled water per year (or about 1,900 AFY). The recycled water produced by the city of Roseville is used outside of the District's retail and wholesale service areas for irrigation of parks and golf courses.

The wastewater generated in Sacramento County is collected and treated at the Regional San Sacramento Regional Wastewater Treatment Plant (SRWTP) in Elk Grove. The SRWTP can treat up to 181 MGD, or about 203,000 AFY of wastewater to secondary effluent levels and can produce up to 3.5 MGD, or 4,000 AFY of Title 22 recycled water. The recycled water is mostly used to irrigate parks, landscape medians, and school fields in Elk Grove. There are no recycled water facilities within the District's retail service area.

Because the SRWTP treats wastewater for a larger population than exists in SJWD, an estimated per capita wastewater generation factor was used to calculate the volume of wastewater generated by the customers in the service area. The wastewater generation factor is based on the total population served and the average dry weather flow for the SRWTP. The plant serves approximately 1.4 million residents and treats an average of 150 MGD, making the average per capita wastewater generation factor for SRWTP 109 gallons per day (GPD) (Regional San, 2014). The estimated total volume of wastewater collected within the District's retail service area in 2015 is shown in Table 6-2. For the purposes of this table, it is assumed that 25 percent of the District's retail population is within the Regional San wastewater collection area and that 75 percent is within the City of Roseville wastewater collection area and that the average per capita wastewater generation factor of 109 GPD is applicable to both Sacramento County and Placer County.

As indicated by Table 6-3, no wastewater is treated or discharged within the District's wholesale or retail service area boundary.

6.5.3 Recycled Water System

CWC 10633

- (c) (Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

As stated in the previous sections, Regional San and the City of Roseville are responsible for the collection, treatment, and discharge of wastewater generated in the SJWD service area. The District currently has no authority for recycled water use in its area, and there is currently no reuse water available in its service area.

6.5.4 Recycled Water Beneficial Uses

CWC 10633

- (d) (Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

CWC 10633

- (e) (Describe) the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

Neither Regional San nor the City of Roseville has plans in place to provide recycled water to the SJWD retail or wholesale service area. As there has been no recycled water use in the retail or wholesale service areas, and none projected, Table 6-4 was not completed.

Table 6-2: Retail: Wastewater Collected Within Service Area in 2015						
<input type="checkbox"/>		There is no wastewater collection system. The supplier will not complete the table below.				
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? (optional)
Sacramento Regional County Sanitation District	Estimated	900	Sacramento Regional County Sanitation District	Sacramento Regional Wastewater Treatment Plant	No	No
City of Roseville	Estimated	2,695	City of Roseville	Dry Creek Wastewater Treatment Plant	No	No
Total Wastewater Collected from Service Area in 2015:		3,595				
NOTES: 1. Volume of Wastewater Collected in units of AFY. 2. Assumes per capita unit flow of 109 GPD (Regional San, 2014). 3. Assumes 25 percent of the District's retail population is within the Regional San wastewater collection area and 75 percent within the City of Roseville wastewater collection area. 4. Does not include septic systems.						

Table 6-3: Wholesale and Retail: Wastewater Treatment and Discharge Within Service Area in 2015									
<input checked="" type="checkbox"/> Wholesale and Retail supplier does not provide supplemental treatment to recycled water it distributes. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Total						0	0	0	0
NOTES: 1. Regional San and the City of Roseville are responsible for the collection, treatment, and discharge of wastewater generated in the SJWD service area. The District currently has no authority for recycled water use in its area, and there is currently no reuse water available in its service area.									

Table 6-4a: Wholesale: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area							
<input checked="" type="checkbox"/> Recycled water is not directly treated or distributed by the supplier. The supplier will not complete the table below.							
Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment	2015	2020	2025	2030	2035	2040 (opt)
Total		0	0	0	0	0	0
NOTES: 1. Neither Regional San nor the City of Roseville has plans in place to provide recycled water to the SJWD retail or wholesale service area.							

Table 6-4b: Retail: Current and Projected Retailers Provided Recycled Water Within Service Area

<input checked="" type="checkbox"/>	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.							
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040 (opt)
		Total:	0	0	0	0	0	0
<i>IPR - Indirect Potable Reuse</i>								
NOTES: 1. Neither Regional San nor the City of Roseville has plans in place to provide recycled water to the SJWD retail or wholesale service area.								

6.5.4.1 Planned Versus Actual Use of Recycled Water

CWC 10633

(e) (Provide) a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

The District did not use any recycled water in 2015. Therefore, a comparison of the projected 2010 against the actual 2015 usage in Table 6-5 was not completed.

Table 6-5a: Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area

<input checked="" type="checkbox"/>	Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2010 Projection for 2015	2015 actual use
Total	0	0
NOTES:		

Table 6-5b: Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual

<input checked="" type="checkbox"/>	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.	
Use Type	2010 Projection for 2015	2015 actual use
Total	0	0
NOTES:		

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

<p>CWC 10633</p> <p>(f) <i>(Describe the) 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.</i></p> <p>CWC 10633</p> <p>(g) <i>(Provide 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.</i></p>
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The District does not have the authority or control to optimize the use of reclaimed water; therefore, the District does not have an optimization Reuse Plan. As the District does not plan to have a reuse supply, it has not implemented any methods to encourage reuse, and Table 6-6 has been intentionally left blank. However, if Regional San or the City of Roseville decides to extend recycled water distribution to the SJWD service area, the District will consider the use of recycled water by its customers.

Table 6-6: Retail: Methods to Expand Future Recycled Water Use			
<input checked="" type="checkbox"/>	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
6-11	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Total			0
<p>NOTES:</p> <p>1. The District does not have the authority or control to optimize the use of reclaimed water; therefore, the District does not have an optimization Reuse Plan. As the District does not plan to have a reuse supply, it has not implemented any methods to encourage reuse. However, if Regional San or the City of Roseville decides to extend recycled water distribution to the SJWD service area, the District will consider the use of recycled water by its customers.</p>			

6.6 Desalinated Water Opportunities

<p>CWC 10631</p> <p>(h) <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.</i></p>
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The District has no sources of ocean water, brackish water, or groundwater that provide opportunities for development of desalinated water as a long-term supply. There are no opportunities at this time for the development of desalinated water within the District's wholesale or retail service areas as future supply source.

6.7 Exchanges or Transfers

CWC 10631

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

As introduced in Chapter 4, the District is evaluating a conjunctive use program within the greater Sacramento metropolitan region both on its own and in conjunction with the Regional Water Authority, a joint powers authority and water management and supply reliability collaborative in the greater Sacramento, Placer, and El Dorado County region. Both of these programs are in their developmental stages. If analysis of the District's program is favorable, it is expected that the SJWD program will begin in 2020 and reach full potential by 2040. At this time, the District assumes all surface water not currently used by its retail service area or wholesale customer agencies will be used in a conjunctive use program by either the District or RWA. Conjunctive use is expected to aid in the reliability and optimization of the District's and the District's wholesale customer agencies' surface water and groundwater supply.

As a preliminary step to evaluating the conjunctive use program, SJWD is currently preparing a wholesale water management and reliability study scheduled for completion in Fall 2016. The study will conduct an alternatives analysis focused on identifying locations and partners to maximize local surface water use and minimize groundwater use in normal hydrologic years and augment reliability to the District wholesale area during dry years. Preliminary concepts may include:

- Increasing surface water storage opportunities.
- Increasing groundwater storage through conjunctive use and/or aquifer storage and recovery programs.
- Working with the RWA to develop a federally recognized groundwater bank to benefit the region and/or other agencies within the State of California.

6.8 Future Water Projects

CWC 10631

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

The District does not have any planned projects to increase water supply. Therefore, Table 6-7 was not completed. The completion of the District's wholesale water supply and reliability study

in 2016 may result in projects to increase water supply for the region or the state of California, but these projects have not been identified or developed at this time.

Table 6-7: Wholesale and Retail: Expected Future Water Supply Projects or Programs						
<input checked="" type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
<input type="checkbox"/>	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Name of Future Projects or Programs	Joint Project with other agencies?		Description	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
	Y/N	Agency Name?				
<p>NOTES:</p> <p>1. SJWD is currently preparing a wholesale water management and reliability study scheduled for completion in Fall 2016. The study will conduct an alternatives analysis focused on identifying locations and partners to maximize local surface water use and minimize groundwater use in normal hydrologic years and augment reliability to the District wholesale area during dry years.</p>						

6.9 Summary of Existing and Planned Sources of Water

<p>CWC 10631</p> <p>(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 10631 (a).</p> <p>(4) (Provide 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.</p>
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The District currently obtains its water supply from Folsom Lake through its USBR CVP Contract, Water Rights, and its contract with Placer County Water Agency. As shown in Table 6-8, in 2015, the District's total available supply was 43,796 AFY:

- During drought years, such as 2015, the District's USBR CVP contract water supply is subject to the CVP Municipal and Industrial (M&I) Water Shortage Policy, which reduces CVP M&I contractor allocations to 75 percent of historic use as agricultural service contractors are reduced to 50 percent allocations, and then to as low as 50% of historic use as agricultural service contractors are reduced to as low as 0%. Historic use is defined as the average of the water use for the most recent three years with unconstrained water use. For the 2015 drought year, historic use was calculated for the District by USBR as 1,593 AF. The CVP water supply available to the District in 2015 was reduced from the full contract amount of 24,200 AFY to 796 AFY.
- In 2015, Folsom Reservoir storage was below 400,000 AF, resulting in a reduction of the District's PCWA contract supply to 10,000 AF.

- The District had access to its full water right in 2015.

Table 6-8: Wholesale and Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield (optional)
Surface water	USBR CVP Folsom Lake	796	Raw Water	24,200
Surface water	Water Right	33,000	Raw Water	33,000
Surface water	Placer County Water Agency	10,000	Raw Water	25,000
Total		43,796		82,200

NOTES:

1. USBR CVP Folsom Lake contract water is subject to CVP M&I Water Shortage Policy and 2015 supplies were reduced to 50% of historical use of CVP supply as calculated by USBR. According to USBR, San Juan's historical use of CVP supply is 1,593 AF (USBR, 2/24/2015).
2. In 2015, Folsom Reservoir inflow was projected to be below 400,000 AFY. Therefore the District's PCWA contract supply was reduced to 10,000 AF.
3. Supply volume in units of AF.

The District's water supply is anticipated to be 100 percent available through the planning period (see Table 6-9) for a normal water year (Folsom Reservoir storage above 950,000 AF). Although the District's CVP supply is impacted by the CVP M&I Water Shortage Policy during drought years, CVP water supply will increase to 75% of full contract amount as the District's calculated historic demand increases. Dry (or drought) year water supply reliability projections are discussed further in Chapter 7.

Table 6-9: Retail and Wholesale: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply <i>Report To the Extent Practicable</i>				
		2020	2025	2030	2035	2040 (opt)
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Surface water	USBR CVP Folsom Lake	24,200	24,200	24,200	24,200	24,200
Surface water	Pre-1914 Right	33,000	33,000	33,000	33,000	33,000
Surface water	Placer County Water Agency	25,000	25,000	25,000	25,000	25,000
Total		82,200	82,200	82,200	82,200	82,200

NOTES:

1. Projected water supply is for a normal year based on Sacramento Water Forum definition of Folsom Reservoir inflow projected above 950,000 AF.
2. Units are in AFY

Chapter 7: Water Supply Reliability

This chapter provides a water supply and demand assessment for the District for a normal year, a single-dry year, and multiple-dry years. The sources of water supply to the water system are not expected to change significantly in the future. The following is a summary of the water supply reliability. The details of water supply sources are provided in Chapter 6, and water demand projections are documented in Chapter 4.

7.1 Constraints on Water Sources

CWC 10631

(c)(2) *For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.*

CWC 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.

7.1.1 Surface Water

The District's annual water supply of 82,200 AF is comprised entirely of surface water diverted from Folsom Lake. The only legal constraints on the current surface water entitlements are contract stipulations.

Contract stipulations are placed on each of the surface water contracts:

- **USBR CVP Folsom Lake:** In dry years, the contract is subject to the CVP M&I Water Shortage Policy, which reduces CVP M&I contractor allocations to 75 percent of historic use as agricultural service contractors are reduced to 50 percent allocations, and then to as low as 50% of historic use as agricultural service contractors are reduced to as low as 0%. This policy defines historical water use as the average quantity of CVP water put to beneficial use within the service area during the most recent three years not constrained by the availability of CVP water. Historical use can be adjusted if requested by a contractor for unique circumstances such as population growth, extraordinary conservation measures, the use of non-CVP water supplies, or to meet public health and safety requirements².
- **Pre-1914 Water Right:** None
- **PCWA:** In years when Folsom Reservoir inflow is projected to be below 400,000 AFY, the District's PCWA contract supply is reduced to 10,000 AF.

² US Bureau of Reclamation, *Central Valley Project Municipal and Industrial Water Shortage Policy Environmental Impact Statement, Final*. August 2015.

In addition, the Placer County portion of the District's wholesale service area has first priority of use of this supply by the District's contract to use federal facilities to transmit PCWA water through Folsom Reservoir and associated facilities. The District is currently evaluating eliminating this constraint on the use of PCWA water.

The Water Forum Agreement is not a legal supply contract constraint, but it does include voluntary limitations to surface water use in dry years. The Water Forum Agreement was developed in an attempt to preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River and in an effort to provide a reliable and safe water supply for the region. The District is a member of the Water Forum and a signatory of the Water Forum Agreement, along with Citrus Heights Water District, Fair Oaks Water District, the City of Folsom, Orange Vale Water District, 18 other local water suppliers, the City and County of Sacramento, and local businesses, public agencies, and environmental groups. Although the Water Forum is not a legal contract stipulation, the District intends to implement the supply reductions as a signatory of the Agreement.

The Water Forum Agreement diversion reductions are dependent upon the March through November projected flow into the Folsom Reservoir:

- When the projected March through November unimpaired inflow into Folsom Reservoir is greater than 950,000 AFY, the year is defined as normal, and the District can divert its full 82,200 AFY.
- Years during which the March through November unimpaired inflow into the Folsom Reservoir is between 950,000 AFY and 400,000 AFY are considered drier years by the Water Forum. During drier years, the District must decrease diversion amounts from 82,200 AFY down to 54,200 AFY in proportion of the decreasing unimpaired inflow to Folsom Reservoir. The decrease in diversion amounts is met by a combination of reductions of PCWA and USBR CVP supply, both contractually and at the District's discretion.
- Driest years (also known as Conference Years) are defined as years when projected March through November unimpaired inflow into Folsom Reservoir is less than 400,000 AFY. During driest years, the Water Forum signatories have agreed to meet and confer to develop a plan for water use.

There are no physical constraints on existing surface water supplies that limit the ability to meet current demands. The capacities of the Folsom Dam diversion, Peterson Water Treatment Plant, and wholesale distribution system are sufficient to divert, treat, and convey the current surface water entitlements.

7.1.2 Groundwater

The District does not pump groundwater; however, as stated in Section 6.7, a 2015 agreement with SSWD allows the District to purchase SSWD groundwater through the Antelope Pump-Back Station when SSWD has adequate groundwater capacity. The Station has a capacity of 10,000 GPM, but it is intended to be used as a dry year or emergency supply only. The physical constraints on the current groundwater supply are the pumping capacities of existing wells. Groundwater wells are owned and operated by the wholesale customer agencies and not the District, therefore capacities and/or constraints are included in each respective agency's UWMP. The District has not evaluated the wholesale customer agency groundwater delivery systems for constraints.

There are no legal constraints that limit groundwater pumping. The SGA was formed in 1999 to manage the southern one-third of the North American Subbasin. SGA's goal is to protect the health of the groundwater basin within Sacramento County north of the American River. The SGA JPA has been delegated the powers necessary to protect and regulate the local groundwater basin to the overlying water purveyors. One objective of SGA is to maintain the long-term sustainable yield of the groundwater basin north of the American River through conjunctive use practices. SGA's goal is to limit the long-term average Sacramento area groundwater pumping to approximately 131,000 AFY, which was approximately the amount of groundwater pumped within the SGA boundaries in 1990. Recent pumping has remained below the 131,000 AFY level. Any fees or other mechanisms to limit or control groundwater pumping would directly affect the wholesale customer agencies that rely on groundwater during drought and emergency conditions.

7.2 Reliability by Type of Year

CWC 10631

(c)(1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

- (A) an average water year,*
- (B) a single dry water year,*
- (C) multiple dry water years.*

The California Water Code requires that UWMPs consider three hydrologic year types: normal year, single-dry year, and multiple-dry year. Historically, the District has had adequate water supplies to deliver 100 percent of wholesale customer agencies and retail demands during all three hydrologic year types.

Table 7-1 presents water supply reliability for the District's contracts discussed in Section 7.1 considering three water supply scenarios: average/normal-year; single-dry year; and multiple-dry years. Table 7-1 includes only contractual reductions in water supply and does not include voluntary water supply reductions listed in the Water Forum Agreement.

Table 7-1: Wholesale and Retail: Bases of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		Agency may provide volume only, percent only, or both	
		Volume Available	% of Average Supply
Average Year	2004	82,200	100%
Single-Dry Year	1977	61,150	74%
Multiple-Dry Years 1st Year	1990	61,150	74%
Multiple-Dry Years 2nd Year	1991	55,100	67%
Multiple-Dry Years 3rd Year	1992	55,100	67%

NOTES:

1. Volume available is based on District water supply contracts only and does not include reductions due to Water Forum Agreement.
2. Average year assumes 100 percent availability of Water Right supply and contract supplies (based on Sacramento Water Forum definition of a normal year with Folsom Reservoir inflow projected above 950,000 AF).
3. For the purposes of this analysis, it is assumed that historical USBR CVP Folsom Lake usage is equal to the full contract amount.
4. The single- and first multiple-dry years assume Folsom Reservoir inflow projected to be between 400,000 and 950,000 AFY: 100 percent availability of Water Right supply, 75 percent availability of full USBR CVP Folsom Lake contract supply, and 10,000 AF of PCWA contract supply.
5. The second and third multiple-dry years assume Folsom Reservoir inflow projected to be below 400,000 AFY: 100 percent availability of Water Right supply, 50 percent availability of full USBR CVP Folsom Lake contract supply, and 10,000 AF of PCWA contract supply.
6. Volume is in AFY.

7.3 Supply and Demand Assessment

CWC 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.*

The available supplies and water demands for the District's wholesale and retail service areas were analyzed to assess the District's ability to satisfy demands during three scenarios: an average/normal year, a single dry year, and multiple dry years. The tables in this section present the supplies and demands for the various water year types for the projected planning period of 2015 to 2040 in five year increments. Because the water supply for the District is the same for its retail and wholesale service areas, for this analysis the demand is the combined retail and wholesale service area demand.

7.3.1 Normal Water Year Analysis

Tables 7-2 demonstrates the reliability of water supplies to meet the District's projected annual wholesale and retail water demands during an average/normal water year. As described previously in this chapter and as shown in the following tables, the District's Folsom Lake water supply is expected to be 100 percent reliable to meet the projected retail and wholesale demands during normal water year conditions through 2040, as presented in Chapter 4. During normal years, the District plans to utilize excess surface water in its conjunctive use program, which is planned to begin operating in 2020 and be fully implemented by 2040.

Table 7-2: Wholesale and Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	82,200	82,200	82,200	82,200	82,200
Demand totals	58,490	64,441	70,314	76,246	82,200
Difference	23,710	17,759	11,886	5,954	0
NOTES: 1. Supply and demand volumes are in AFY. 2. Average year assumes 100 percent availability of Water Right supply and contract supplies (based on Sacramento Water Forum definition of a normal year for Folsom Reservoir inflow projected above 950,000 AF). 3. Demands are the total retail and wholesale service area demands as projected in Chapter 4 Tables 4-2a and 4-3a and include future conjunctive use program.					

7.3.2 Single Dry Year Analysis

For the purposes of long-term planning, the District's minimum contractually available water supply is 55,100 AFY, as previously shown in Table 7-1. However, the Water Forum Agreement's voluntary limitations result in a lower available water supply in dry years. The Water Forum Agreement is not a legal constraint on the District's ability to divert surface water; however, the District intends to implement agreed-upon diversion reductions during years when Folsom Lake levels are low.

Under the Water Forum Agreement, during drier years, the District's Folsom Lake diversion can be reduced in proportion to lake level, to a minimum of 54,200 AFY. Therefore, although the

District's minimum contractually available Folsom Lake water supply is 55,100 AFY, for the purposes of this analysis, the District's single dry year water supply is equal to 54,200 AFY.

For calculating the water supplies and expected demands for the single-dry years through 2040, the following procedure is applied:

1. Assume that Folsom Reservoir inflows are projected to be between 400,000 AFY and 950,000 AFY (non-Conference Years). SJWD intends on complying with the Water Forum Agreement, which can reduce total surface water diversion in proportion to the water level in Folsom Lake to a minimum of 54,200 AFY. Therefore, it is assumed that available supply will be the minimum of 54,200 AFY. The decrease in diversion amounts will be met by a combination of reductions of PCWA and USBR CVP supply, both contractually and at the District's discretion.
2. Water supply will not be available for the City of Roseville or for conjunctive use during a single dry year.
3. Assume that District's retail service area water demands will meet SBX7-7 objectives through implementation of demand management measures described in Chapter 9.
4. The District retail water service area and wholesale customer agencies (including SJWD retail) will implement their respective Water Shortage Contingency Plans (WSCPs).
5. If the supply-demand balance shows a shortage, wholesale customers with groundwater supplies (FOWD and CHWD) will increase groundwater pumping to offset surface water supply.
6. SSWD groundwater will be provided to the SJWD through the Antelope Pump-Back Booster Station. This supply is only intended to be activated during dry years or when SJWD's surface water supplies are reduced. SSWD groundwater is estimated to provide an additional 5,300 AFY.

Table 7-3 summarizes the above water supply and demand calculations and assumptions for the single dry year.

Table 7-3: Wholesale and Retail: Single Dry Year Supply and Demand Calculations

	2020	2025	2030	2035	2040
Existing Supply Contracts					
Water Rights	33,000	33,000	33,000	33,000	33,000
USBR CVP Folsom Lake Contract	24,200	24,200	24,200	24,200	24,200
PCWA Contract	25,000	25,000	25,000	25,000	25,000
Total Supply Contracts	82,200	82,200	82,200	82,200	82,200
Dry Year Supply Reductions					
Water Rights	0	0	0	0	0
Water Forum Agreement Maximum Reductions ⁽¹⁾	-28,000	-28,000	-28,000	-28,000	-28,000
Total Existing Supplies	54,200	54,200	54,200	54,200	54,200
Demand					
Wholesale Demand ⁽²⁾	50,313	52,088	53,783	55,539	57,316
20x2020 Reduction in Retail Demand ⁽³⁾	-1,493	-1,580	-1,660	-1,743	-1,827
Reduction from WSCP ⁽⁴⁾	-7,323	-7,576	-7,819	-8,069	-8,323
Demand w/ Conservation	41,497	42,932	44,305	45,727	47,166
Supply-Demand Balance	12,703	11,268	9,895	8,473	7,034
Supplemental Groundwater					
Additional Wholesale Groundwater Pumping ⁽⁵⁾	0	0	0	0	0
Antelope Booster Pump-Back Station Groundwater (SSWD) ⁽⁶⁾	0	0	0	0	0
Total Supplemental Groundwater	0	0	0	0	0

NOTES:

1. Assumes projected inflow to Folsom Reservoir is between 400,000 AFY and 950,000 AFY (non-Conference Year). SJWD is a signatory to the Water Forum Agreement which can reduce total surface water diversion in proportion to the water level in Folsom Lake to as low as 54,200 AF. The decrease in diversion amounts will be met by a combination of reductions of PCWA and USBR CVP supply, both contractually and at the District's discretion.
2. Projected wholesale water demands from Chapter 4, Table 4-3a, minus water supply to City of Roseville (4,000 AF).
3. Reduction needed to meet retail SBX7-7 compliance calculated in Chapter 5.
4. 15 percent reductions from wholesale demand by implementing WSCP Stage 3. See Chapter 8, Water Shortage Contingency Planning.
5. Groundwater supply from wholesale customer agencies used to replace surface water supply reductions per the Water Forum Agreement and the WSCP in Chapter 8.
6. SSWD groundwater via the Antelope Booster Pump-Back Station is intended to be provided during the summer months in dry years or when SJWD's surface water supplies are reduced.

Table 7-4 demonstrates the reliability of water supplies to meet the District’s projected annual combined wholesale and retail water demand during a single dry water year.

Table 7-4: Wholesale and Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	54,200	54,200	54,200	54,200	54,200
Demand totals	41,497	42,932	44,305	45,727	47,166
Difference	12,703	11,268	9,895	8,473	7,034

NOTES:

1. Supply and demand volumes are in AFY.
2. Assumes Folsom Reservoir projected inflows to be between 400,000 AFY and 950,000 AFY (non-Conference Years): the Water Forum Agreement reduces SJWD Folsom Lake diversions in proportion to lake levels to a minimum of 54,000 AF. Reduction will be met by a combination of reductions of PCWA and USBR CVP supply, both contractually and at the District’s discretion.
3. Demands are the total retail and wholesale service area demands as projected in Chapter 4 Tables 4-2a and 4-3a and include retail water use reductions to meet SBX7-7, and implementation of WSCPs. Demand does not include conjunctive use.
4. Supply shortfall is expected to be met by supplemental groundwater pumping by SJWD wholesale customer agencies with pumping capability and SSWD groundwater via the Antelope Pump-Back Booster Station.
5. Based on DWR Table 7-3.

7.3.3 Multiple Dry Year Analysis

The District’s multiple dry year supply and demand analysis is similar to the single dry year analysis, with the Water Forum Agreement resulting in a lower supply than what would be contractually available. For calculating the water supplies for the multiple dry years through 2040, the following procedure is applied:

1. SJWD intends on complying with the Water Forum Agreement, which can reduce total surface water diversion in proportion to the water level in Folsom Lake to a minimum of 54,200 AFY. Therefore, it is assumed that available supply will be the minimum of 54,200 AFY. The decrease in diversion amounts will be met by a combination of reductions of PCWA and USBR CVP supply, both contractually and at the District’s discretion.
2. Water supply will not be available for the City of Roseville or for conjunctive use during a single dry year.
3. Assume that District’s retail service area water demands will meet SBX7-7 objectives through implementation of demand management measures described in Chapter 9.

4. The District retail water service area and wholesale customer agencies (including SJWD retail) will implement their respective Water Shortage Contingency Plans (WSCPs).
5. If the supply-demand balance shows a shortage, wholesale customers with groundwater supplies (FOWD and CHWD) will increase groundwater pumping to offset surface water supply.
6. SSWD groundwater will be provided to the SJWD through the Antelope Pump-Back Booster Station. This supply is only intended to be activated during dry years or when SJWD's surface water supplies are reduced. SSWD groundwater is estimated to provide an additional 5,300 AFY.

The wholesale and retail water supply and demand calculations and assumptions for the single dry year in Table 7-3 of the previous section are identical to those for multiple dry years. Table 7-5 demonstrate the reliability of water supplies to meet the District's projected annual combined wholesale and retail water demand during a multiple dry water year.

7.3.4 Summary of Comparisons

Even with water supply reduced to below the District's minimum contract Folsom Lake volume of supply, as shown in the previous sections, the District is expected to meet 100 percent of wholesale and retail water demands during normal water, single dry, and multiple dry water years through 2040, requiring no supplemental groundwater from either wholesale customer agency pumping or from SSWD. SJWD supply will continue to meet wholesale and retail demands through regional cooperation, continued implementation of demand management measures, and existing water shortage contingency plans discussed further in Chapter 8 and 9 respectively.

Table 7-5: Wholesale and Retail: Multiple Dry Years Supply and Demand Comparison

		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	54,200	54,200	54,200	54,200	54,200
	Demand totals	41,497	42,932	44,305	45,727	47,166
	Difference	12,703	11,268	9,895	8,473	7,034
Second year	Supply totals	54,200	54,200	54,200	54,200	54,200
	Demand totals	41,497	42,932	44,305	45,727	47,166
	Difference	12,703	11,268	9,895	8,473	7,034
Third year	Supply totals	54,200	54,200	54,200	54,200	54,200
	Demand totals	41,497	42,932	44,305	45,727	47,166
	Difference	12,703	11,268	9,895	8,473	7,034

NOTES:

1. Supply and demand volumes are in AFY.
2. Assumes Folsom Reservoir projected inflows to be between 400,000 AFY and 950,000 AFY (non-Conference years): the Water Forum Agreement reduces SJWD Folsom Lake diversions in proportion to lake levels to a minimum of 54,000 AF. Reduction will be met by a combination of reductions of PCWA and USBR CVP supply, both contractually and at the District's discretion.
3. Demands are the total retail and wholesale service area demands as projected in Chapter 4 Tables 4-2a and 4-3a and include retail water use reductions to meet SBX7-7, and implementation of WSCPs. Demand does not include conjunctive use.
4. Supply shortfall is expected to be met by supplemental groundwater pumping by SJWD wholesale customer agencies with pumping capability and SSWD groundwater via the Antelope Pump-Back Booster Station.
5. Based on DWR Table 7-4.

Chapter 8: Water Shortage Contingency Planning

This chapter addresses the requirements in Section 10632 of the Act for the water shortage contingency analysis including stages of actions, prohibitions on end uses, penalties/charges/other prohibitions, consumption reduction methods, determining water shortage reductions, revenue and expenditure impacts, resolution or ordinance, catastrophic supply interruption, and minimum supply over the next three years.

8.1 Stages of Action

CWC 10632

(a)(1) *Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.*

The Water Forum Agreement (WFA) to which the District is a signatory, describes supply scenarios related to Folsom Reservoir unimpaired inflows from March through November for normal, dry, and driest (conference) years. All WFA signatories agree to reduce surface water diversions from Folsom Reservoir in accordance with the operating rules in Table 8.1.

Table 8-1: Water Forum Agreement Folsom Reservoir Unimpaired Flows (March-November)		
Impact Period	March-November Unimpaired Inflows Folsom Reservoir	SJWD Wholesale Diversion/Use
Normal	Greater than 950,000 AF	82,200 AF
Drier Years	400,000-950,000 AF	54,200-82,200 AF
Driest Years	Less than 400,000 AF	54,200 or less AF

The Water Forum Agreement acknowledges that there may be critically dry years when available surface water supplies are less than even the stipulated decreases planned for in the Water Forum Agreement. For the Driest Years condition, the signatories agree to conference in agreeing on shared Folsom Reservoir supply reductions during critically dry years when unimpaired inflows are below 400,000 AF. In the WFA, the San Juan Consortium (San Juan and its wholesale customer agencies) agrees to deploy two strategies to reduce reliance on surface water supplies during critically dry years, as follows:

1. Wholesale customer agencies would reduce water demands based on current conditions, or by 15 percent.
2. Wholesale customer agencies agree to rely on groundwater resources on an interim basis to reduce surface water needs during Driest Years.

The District may also experience short-term water shortages due to mechanical failures, earthquakes, power outages, or other unforeseen circumstances that impact available water

supplies. The level of water demand reductions and/or interim groundwater supply augmentation that would occur to balance supply and demand under such conditions would be addressed by updating District water shortage response polices in collaboration with the wholesale customer agencies.

The District has two existing water shortage contingency plans. The first plan is the District’s long-standing water shortage contingency plan that addresses wholesale customer agency shortage conditions with accompanying wholesale customer agency requirements. The second is the District’s retail plan, also referred to as the San Juan Water District Water Supply and Water Shortage Plan, which solely addresses the District’s retailer water shortage response strategy. Both plans are being considered for updating to reflect changing conditions and the desired mix of demand and supply response measures the District would employ during future water shortage conditions. Both water shortage contingency plans are included in Appendix G.

Table 8-2 summarizes the District’s recommended water shortage contingency plan provisions to be considered for updating its existing water shortage contingency policies.

The first change would be to establish the District’s 2020 water use target of 413 GPCD as the baseline from which to gauge future demand reductions required in each stage. The District’s 2020 water use target would become the new normal water use standard for the service area and would serve as the best baseline water use benchmark.

The stages below represent the District’s current shortage plan stage delineations. The response measures could be consolidated to reflect the demand reductions required in each stage.

Table 8-2: Wholesale and Retail: Stages of Water Storage Contingency Plan		
Stage	Percent Supply Reduction ¹	Water Supply Condition
1	0	Normal Water Conditions, GPCD = 413
2	5-10	Minimal supply reductions, GPCD Range = 370-392
3	11-25	Supplies not be able to meet demands, GPCD Range = 308-369
4	26-50	Supplies not able to meet demands, GPCD Range = 206-307
5	50 and greater	Major failure of a supply, storage, or distribution system, GPCD Range < 206
¹ One stage in the WSCP must address a water shortage magnitude of 50%.		
NOTE: 1. Based on DWR Table 8-1 Wholesale: Stages of WSCP. 2. Stages and conditions as shown in this UWMP are draft.		

The recommended triggers for each stage are summarized in Table 8-3 below.

Table 8-3: Recommended District Water Shortage Trigger Summary	
Stage in Effect	Trigger Threshold
Stage 1	Folsom Reservoir unimpaired Mar-Nov inflows >900,000 AF.
Stage 2	Folsom Reservoir unimpaired Mar-Nov inflows <950,000 AF. WFA agreement provisions triggered for additional 15% conservation State mandated reductions
Stage 3	Folsom Reservoir unimpaired Mar-Nov inflows <400,000 AF. State mandated reductions.
Stage 4	Folsom Reservoir unimpaired Mar-Nov inflows <300,000 AF. Emergency/Unforeseen supply interruption State mandated reductions Groundwater augmentation supplies initiated (as needed)
Stage 5	Folsom Reservoir unimpaired Mar-Nov inflows <150,000 AF. Emergency/Unforeseen supply interruption Groundwater augmentation supplies increased (as needed)

The recommended water shortage contingency plan trigger thresholds provide the District with a planned approach for responding to water shortage conditions. Trigger thresholds may be adjusted based on specific conditions such as the availability of ample supplies from conjunctive use operations or changes in unimpaired flow standards.

How the District would respond in the event a given stage is triggered is summarized below. The magnitude of response measures increases with shortage severity.

Table 8-4: Recommended District Water Shortage Response Measure Summary

Stage in Effect	Corresponding Response Measures
Stage 1	Wasteful uses of water are prohibited. No water runoff from customer property. Auto shut-off nozzles required on all hoses. Customer leaks must be repaired within five (5). Pool recirculation pumps required and pool filling and refilling allowed for health/safety purposes only Customer participation is encouraged in District DMM programs. ADD: Implement voluntary 3/day per week watering program
Stage 2	All Stage 1 measures in effect. Washing hard surfaces prohibited (health/safety exceptions). Institute mandatory 3 day/week watering program.
Stage 3	All Stage 1 and 2 measures in effect. Institute mandatory 2/day week watering program Drought surcharges will be implemented.
Stage 4	All Stage 1-3 measures in effect. Consider implementing customer water allocation program if needed to meet reduction targets (subject to Board approval). Additional drought surcharges may be implemented. Installation of new turf/landscaping prohibited. System flushing prohibited except for emergencies.
Stage 5	All Stage 1-4 measures in effect. No outdoor water use (exceptions: trees, graywater, rain barrels) Additional drought surcharges may be implemented. New connections to the District's system will not be allowed.

The District can update its water shortage contingency policies to reflect future water use targets, update shortage condition triggers, refine stage criteria, update response measures, and identify District action plans to implement water shortage measures. This effort should be done in collaboration with District wholesale customer agencies to synthesize and refine the specific demand reduction and supply augmentation measures that the agencies would agree to implement during various future water shortage conditions. This information may result in modifying stage ranges, trigger thresholds, and corresponding response measures for each stage. Updating the District's water shortage contingency plan before the next water shortage condition will better prepare the District to respond and minimize impacts to the community. Both of the existing District water shortage contingency policies would be updated based on outcomes from the update process.

8.2 Prohibitions on End Uses

CWC 10632	
(a)(4)	<i>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.</i>
(5)	<i>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.</i>

The following table characterizes the planned water shortage prohibitions depending on which water shortage stage is in effect. Mandatory prohibitions become important as water shortage conditions worsen and water use cutbacks are critical. Beginning water shortage response with voluntary prohibitions provides customers with an opportunity to meet established water use reduction targets before mandatory prohibitions are imposed during later stages of the water shortage condition to meet higher use reduction targets. The table below may be updated or amended in the future depending on water shortage conditions and customer response required to meet water shortage reduction targets.

Table 8-5: Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference (optional)	Penalty, Charge, or Other Enforcement?
1-3	Other - Prohibit use of potable water for washing hard surfaces	Street/Sidewalk Cleaning	Yes
1-3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		Yes
1-3	Landscape - Restrict or prohibit runoff from landscape irrigation	Gutter Flooding	Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		Yes
4	Other water feature or swimming pool restriction	Restricted filling of pools	Yes
5	Landscape - Prohibit all landscape irrigation		Yes
5	Other	No new connections	Yes
NOTES: 1. Based on DWR Table 8-2.			

8.2.1 Landscape Irrigation

Landscape irrigation reductions focus on less watering and reducing or avoiding water waste during irrigations. Landscape irrigation reductions may vary by user class or customer type depending on water shortage conditions and ability to meet water use reduction targets. Water budget concepts may be applied by the District to equitably reduce landscape water use while minimizing customer impact.

8.2.2 Commercial, Industrial, and Institutional (CII)

The CII category of customers is diverse and will require a tailored approach for meeting specified water use reduction targets. This could include focusing on landscape irrigation, process water efficiency or reuse, business practices, or other means to meet CII water use reduction targets. The ability of CII customers to conserve water during a water shortage condition would be considered depending on which stage has been triggered and how much has already been saved during previous stages.

8.2.3 Water Features and Swimming Pools

Water shortage response would focus on health and safety issues and tempering these uses based on the severity of the water shortage condition. The relative total water use from these sources would be a consideration for how water feature uses would be curtailed during specific water shortage conditions. Water features are a relatively small discretionary use and may be impacted at any time during a triggered water shortage condition.

8.2.4 Defining Water Features

The District would identify water features and estimate water use to be treated as a potential target for future demand reductions required during a water shortage condition.

CWC 10632

(b) Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

Health and Safety Code Section 115921

As used in this article the following terms have the following meanings:

(a) "Swimming pool" or "pool" means any structure intended for swimming or recreational bathing that contains water over 18 inches deep. "Swimming pool" includes in-ground and aboveground structures and includes, but is not limited to, hot tubs, spas, portable spas, and non-portable wading pools.

8.2.5 Other

Other uses of water could be curtailed as required to meet specific water shortage use reduction targets.

8.3 Penalties, Charges, Other Enforcement of Prohibitions

CWC 10632

(a)(6) Penalties or charges for excessive use, where applicable.

Penalties, charges, or other enforcement actions may be imposed if voluntary actions are not meeting specific water shortage use reduction targets or continued and repeated water waste

practices are occurring during specific water shortage conditions. The District may implement penalties and charges as listed in Table 8-6. The District may impose additional provisions as needed to meet more severe water shortage conditions associated with triggering higher stages of action.

Table 8-6: Penalties and Charges	
Examples of Penalties and Charges	Stage When Penalty Takes Effect
Continued and repeated water waste	1
Termination of service and reconnect fee	1
Penalties for not reducing consumption	4

If a water allocation policy is approved by the District, additional penalties and charges would be considered as necessary to meet water use reductions targets in a given water shortage condition.

8.4 Consumption Reduction Methods

<p>CWC 10632</p> <p>(a)(5) <i>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.</i></p>
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The District can use other consumption reduction methods to reduce water use up to 50 percent. Based on the requirements of the Act, Table 8-7 summarizes the methods that can be used by the District in order to achieve or enforce a reduction in consumption, when necessary.

Table 8-7: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Consumption Reduction Method	Stage When Method Takes Effect	Projected Reduction Percentage
Demand reduction program	All Stages	N/A
Reduce pressure in water lines; Flow restriction	5	N/A
Restrict building permits; Restrict for only priority uses	4-5	N/A
Use prohibitions	2-5	N/A
Water shortage pricing; Per capita allotment by customer type	4-5	N/A

Table 8-7: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Consumption Reduction Method	Stage When Method Takes Effect	Projected Reduction Percentage
Plumbing fixture replacement	All Stages	N/A
Voluntary rationing	1-3	N/A
Mandatory rationing	4-5	N/A
Incentives to reduce water consumption; Excess use penalty	3-5	N/A
Water conservation kits	All Stages	N/A
Education programs	All Stages	N/A

8.4.1 Categories of Consumption Reduction Methods

The District has reviewed the consumption reduction methods and could include the following categories as alternative means to achieve specific water use reductions for a given water shortage condition on an as-needed basis.

Table 8-8: Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference (optional)
1	Offer Water Use Surveys	
1	Provide Rebates for Landscape Irrigation Efficiency	
1	Provide Rebates on Plumbing Fixtures and Devices	
3	Expand Public Information Campaign	Continue and expand long-standing public information campaign
3	Decrease Line Flushing	Limit water use to a few key hydrant locations
3	Reduce System Water Loss	Perform system water loss audits
3	Increase Water Waste Patrols	Increase long-standing active water waste patrol program
3	Implement or Modify Drought Rate Structure or Surcharge	Utilize a drought rate surcharge

NOTES: Based on DWR Table 8-3.

The District would utilize additional consumption reduction methods as required to meet water shortage reduction goals.

8.5 Determining Water Shortage Reductions

CWC 10632

(a)(9) *A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.*

The Act requires an analysis of mechanisms for determining actual reductions in water use when the District's Water Shortage Contingency Plan is in effect. Table 8-9 lists the possible mechanisms that could be used by the District to monitor water use and quality of data expected. The District may collect additional data as necessary to accurately determine water use reductions.

Table 8-9: Water-Use Monitoring Mechanisms	
Mechanisms for Determining Actual Reductions	Type and Quality of Data Expected
Customer meter readings	Bi-Monthly Meter Read Data Special Reads As Required In The Future: Hourly/daily/monthly water consumption data for a specific user depending on frequency of readings
Production meter readings	Daily and Monthly water production depending on frequency of readings; correlates to water use plus system losses

In addition to the specific actions that the District can undertake to verify the level of conservation being achieved, the District can monitor and evaluate customer metered demand data to flag exceptionally high usage (for verification of water loss or abuse), or exceptionally low usage (for verification of meter registration inaccuracies). This could improve the accuracy of measurable water savings being achieved for a specific water shortage condition.

8.6 Revenue and Expenditure Impacts

CWC 10632

(a)(7) *An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.*

The District's rate structure is set to reflect actual water production and delivery costs plus fixed overhead costs in normal operating conditions. Therefore, if sales are reduced, the District does not have adequate reserves to cover the reduced revenues from sustained lower water demand conditions experienced during water shortages. The District maintains a contingency fund for short-term revenue fluctuations experienced from normal variations in annual system water demands. The District will measure treatment plant production, customer demands, wholesale purchases,

and its finances to monitor the success of its water reduction programs and maintain proactive awareness of any financial impacts on contingency fund reserves.

8.6.1 Drought Rate Structures and Surcharges

The District's rate structure is set to reflect actual water production and delivery costs plus fixed overhead costs in normal operating conditions. Therefore, if sales are reduced temporarily, the District has adequate reserves to cover lower revenues. The District maintains a contingency fund for short-term revenue fluctuations for use during short term demand reduction conditions. The District will measure treatment plant production, customer demands, wholesale purchases, and its finances to monitor the success of its water reduction programs and maintain proactive awareness of any financial impacts. Drought surcharges may be used by the District on an as needed basis to maintain adequate contingency fund balances and recover some costs associated with extended water shortage conditions. Any drought surcharges imposed to mitigate prolonged demand reduction scenarios would be discontinued upon declaration by the District that water shortage conditions are no longer in effect.

8.6.2 Use of Financial Reserves

The District's rate structure is set to reflect actual water production and delivery costs plus fixed overhead costs. The District maintains a contingency fund for short-term revenue fluctuations associated with annual variations in system water demands. Therefore, if short term sales are reduced, the District does not anticipate a long-term impact to District finances. The District's financial reserves are allocated for prescribed use for O&M, capital, and rate stabilization purposes. The District's financial reserves are not adequate to cover prolonged demand reduction periods associated with water shortage conditions. Drought surcharges may be used by the District to help cover some increased costs of water shortage response

8.6.3 Other Measures

The District's rate structure is set to reflect actual water production and delivery costs plus fixed overhead costs during normal operating conditions. Therefore, if short term sales are reduced, the District does not anticipate a long-term impact to District finances during a water shortage. The District maintains a contingency fund for short-term revenue fluctuations for use during such conditions. The District will measure treatment plant production, customer demands, wholesale purchases, and its finances to monitor the success of its water reduction programs and maintain awareness of any financial impacts.

8.7 Resolution or Ordinance

CWC 10632

(a)(8) A draft water shortage contingency resolution or ordinance.

The District's Code of Ordinance included in Appendix G.

8.8 Catastrophic Supply Interruption

CWC 10632

(a)(3) *Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.*

In June 2011 the District updated its Emergency Response Manual, which includes preparation of a security vulnerability assessment and maintains an emergency response plan to address how it responds to catastrophic supply interruptions as well as other emergencies. Table 8-10 summarizes the responses to major catastrophes. In addition, the District has the following resources in place to mitigate the impact of catastrophic emergencies and inconvenience to its wholesale customer agencies and retail customers:

- An existing emergency response procedure for immediate action.
- Participation in a regional mutual aid agreement with the City of Sacramento and other local agencies to increase recovery capabilities.
- Membership with the “California Utilities Emergency Association” (CUEA) to augment the District’s Emergency Operation Procedures and Emergency Response Plan.
- District’s preparedness through comprehensive training, education and emergency planning.
- Membership with the Inland Region “Water Agency Response Network” (WARN) IV Mutual Aid Network to secure resources in the geographic area if necessary.
- San Juan Water is a member of the WARN IV steering committee created to expand the network and improve participation within Region IV.

Table 8-10: Possible Catastrophic Situations and Actions

Possible Catastrophic Situation	Type and Quality of Data Expected
Regional Power Outage	<p>Command chain is defined that dispatches District crews to operate generators and monitor operations.</p> <p>Criteria and procedures are provided to return system to normal operations. A plan contains contact information for responsible parties and supportive services.</p> <p>Applicable provisions of District water shortage contingency plan are instituted as required to address supply interruptions.</p>

Table 8-10: Possible Catastrophic Situations and Actions	
Possible Catastrophic Situation	Type and Quality of Data Expected
Earthquake	<p>Command chain is defined that dispatches District crews to operate generators and monitor operations.</p> <p>Operations response crews assigned to monitor system operations and modify as necessary.</p> <p>Communication command chain is defined to coordinate with other local water agencies and emergency response officials as necessary.</p> <p>Applicable provisions of District water shortage contingency plan are instituted as required to address supply interruptions.</p>
Extremely Low Folsom Lake Unimpaired Inflows	<p>Applicable provisions of District water shortage contingency plan are instituted as required to address supply interruptions.</p> <p>Regional groundwater sources are activated as available to offset surface water shortages.</p>

8.9 Minimum Supply Next Three Years

CWC 10632
(a)(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

The District has estimated the minimum water supply available during each of the next three years (2016-2018). This reflects the combined availability of all water sources and assumes the same hydrology as used during the historical multiple dry year period analyzed in Chapter 7. The available water supply matches the WFA supply reliability schedule that dictates available supply from Folsom Reservoir, the primary supply for the District and its wholesale customer agencies.

Table 8-11: Wholesale and Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	54,200	54,200	54,200
NOTES: NOTES: 1. Supply in units of AFY. 2. Based on Water Forum Agreement minimum Folsom Lake diversions for SJWD for drier (non-Conference years). 3. The District's retail service area water supply is the same as the District's wholesale customer agencies' supply.			

The 54,200 AFY is the new baseline surface water supply allocation that the San Juan wholesale customer agencies would share during reduced Folsom Reservoir flow conditions.

Chapter 9: Demand Management Measures

San Juan Water District has had a long-standing commitment to water use efficiency and was an early adopter of water conservation programs in California. Conservation programs were developed in 1988 as a condition of the water rights agreement with the US Bureau of Reclamation. The District created a water efficient landscape garden in 1992 as a demonstration project to assist residents in maintaining an outdoor landscape that uses less water and is easy to maintain.

In 2000, the District was a founding member of the Sacramento Water Forum, a diverse group of business and agricultural leaders, citizen groups, environmentalists, water managers, and local governments working together to balance two co-equal objectives: (1) to provide a reliable and safe water supply for the Sacramento region's long-term growth and economic health; and (2) to preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River. In the commitment to reduce water use, San Juan Water District provides annual reports to the Sacramento Water Forum with updates on its conservation practices.

In 1999 the District signed the Memorandum of Understanding Regarding Water Conservation in California and became a member of the California Urban Water Conservation Council (CUWCC).

9.1 Demand Management Measures for Wholesale Customer Agencies

CWC 10631

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

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

(ii) Metering.

(iv) Public education and outreach.

(vi) Water conservation program coordination and staffing support.

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

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

This section addresses Demand Management Measures (DMMs) that wholesale water suppliers must comply with in accordance with the Act. SJWD is considered both a wholesale and retail agency by DWR. These DMMs are considered standard for urban wholesale suppliers to be implementing on a regular basis. The following DMM narratives represent the District's past and current wholesale programs.

9.1.1 Metering

Wholesale deliveries are 100% metered. Meters are read monthly and an internal quality control analysis is conducted. Annually, a software program is utilized to confirm proper functionality.

9.1.2 Public Education and Outreach

As part of its water conservation and efficiency program, the District implements a public information program through active participation in the RWA Regional Water Efficiency Program and through the following District managed methods:

- Generate newspaper articles on water saving techniques as well as water efficiency and conservation information.
- Maintain an extensive literature collection and video library providing landscape and water- related resources available to students, teachers, and customers.
- Provide public information booth with water efficiency and conservation information at related fairs and events.
- Participate in special events and media events to promote water efficiency and conservation.
- Provide landscape irrigation, composting, and tree-pruning classes to customers, emphasizing water efficiency and conservation.
- Provide an annual water awareness calendar to customers.
- Support paid water efficiency and conservation advertising through RWA membership.
- Provide water efficiency and conservation public service announcements through RWA membership.
- Maintain and promote demonstration Water Efficiency Landscape (WEL) garden and provide tours for individuals and groups.
- Participate in the regional water efficiency and conservation speaker's bureau.
- Participate in coordinated water efficiency and conservation programs with other government agencies, industry, and public interest groups, and the media.
- Provide timely and comprehensive water efficiency and conservation information as well as drought updates on the District's website.
- The District annually monitors a number of events for each category and report in the annual CUWCC BMP reports.

9.1.3 Water Conservation Program Coordination and Staffing Support

The wholesale customer agencies share a Water Resource Analyst that assists with the Water Conservation Program. The Analyst's duties and responsibilities include the following:

- Coordination and oversight of wholesale conservation program and water efficiency measures
- Tracking, planning, and reporting CUWCC BMP implementation
- Coordination of District DMM program planning and implementation efforts with the District executive team and other key staff
- Coordination of DMM programs with other agencies
- Preparation of annual BMP budgets
- Participation in CUWCC plenary and committee meetings
- Preparation of conservation elements in the District's Urban Water Management Plan

9.1.4 Other Demand Management Measures

The District provides and maintains a Water Efficient Landscape garden to serve as a resource for customers to plan and design water efficient landscapes in the service area.

Asset Management

San Juan Water District tracks and manages its assets using a computer maintenance management system (CMMS). The system is also used for maintenance, safety inspection, service calls and reporting. The program is maintained by Field Services and Water Treatment Plant staff and is overseen by the respective department managers.

CMMS contains information on District assets, such as date installed, materials used, maintenance requirements and any other pertinent information depending on the asset. New assets are entered into CMMS for tracking and management purposes. If maintenance is required related to an asset, a work order is generated and sent to the appropriate person for action. Maintenance history is reviewed and used to make decisions regarding broader scope improvements if needed for a specific item or facility.

9.1.5 Wholesale Supplier Assistance Programs

The District is a wholesale water agency as well as a retail water agency. The District provides technical support through workshops on residential and large turf irrigation, serves as a technical resource for BMP compliance, provides program management support for various DMMs and maintains and promotes a water-efficient demonstration garden that is open to the public. In addition, the District has an extensive video library, provides speakers for school presentations, and coordinates the annual water-awareness poster contest.

The District's wholesale agencies are all members of the Regional Water Authority (RWA). The RWA is a joint powers authority formed in 2001 to promote collaboration on water management and water supply reliability programs in the greater Sacramento, Placer, and El Dorado County

region. RWA applies for and receives regional grants and administers water conservation and efficiency public outreach and school education campaigns that satisfy the requirements of the respective BMPs. RWA also holds technical sessions where new conservation technologies and program implementation methods and practices are shared, reviewed, and discussed. District staff attends CUWCC workshops and meetings on behalf of its retail agencies.

9.2 Demand Management Measures for Retail Agencies

The District implements a comprehensive DMM program as a retail water agency in the service area where it directly supplies water to customers. These narratives represent past and current DMM programs the District has implemented for its customers. The District satisfies the California Urban Water Conservation Council BMP requirements in addition to supplemental programs that further increase water use efficiency.

9.2.1 Water Waste Prevention Ordinances

The District has a water waste prohibition that prohibits gutter flooding, non-recirculating systems in decorative fountains, and evaporative coolers, and unnecessary/wasteful uses of water. District conservation staff responds to all water waste complaints and requests for assistance from customers. They show customers how to improve system performance and water efficiency. In some cases, staff repair minor leaks for customers, which is a no-cost service included in the conservation budget. The water waste prohibition is part of the San Juan Water District's Code of Ordinance.

9.2.2 Metering

CWC 526

- (a) Notwithstanding any other provisions of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract... shall do both of the following:
 - (1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings... located within its service area.**

CWC 527

- (a) An urban water supplier that is not subject to Section 526 shall do both the following:
 - (1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.**

The District became 100% metered in 2004 and began billing for water service based on metered rates in 2005. The District has a meter testing, repair and replacement program managed through the District's Asset Management Program that is updated periodically to reflect aging meter inventory, meter repairs and replacements, and new metering technology.

The District is discussing an upgrade to an Advanced Metering Infrastructure (AMI) system to allow for hourly reads to detect customer leaks in real-time and provide more water use information to enhance customer water management capabilities. The District will evaluate this option and determine its role in future water management programs.

9.2.3 Conservation Pricing

All of the District's retail customers are metered. Water service is billed based on a fixed charge (based on meter size) plus a single tier consumption charge. During drought years, the District

may institute a drought surcharge to mitigate the lower revenue associated with demand reductions to meet water shortage targets as indicated below.

Table 9-1: San Juan Water District – Retail Rate Overview				
Base Charge (\$/Day)	2015 Normal	2015 Drought	2016 Normal	2016 Drought
1-inch meter size	\$1.08	\$1.08	\$1.24	\$1.24
1 ½ inch meter size	\$2.88	\$2.88	\$3.31	\$3.31
Volumetric Rate	2015 Normal	2015 Drought	2016 Normal	2016 Drought
\$/ccf (1 ccf = 748 gallons)	\$0.80	\$0.88	\$0.92	\$1.012

Table 9-1 summarizes the District’s recent water rates for residential customers in 2015 and 2016. In adopting rates, the District included drought surcharges that could be implemented on a temporary basis as needed to supplement financial reserves. Approximately 40% of District retail revenues are derived from volumetric charges.

The District has the flexibility to implement drought surcharges as it has done during the current water shortage conditions. The drought surcharge allows the District to recover some of the additional costs associated with drought response measures and to supplement reduced revenue when consumption revenues are reduced. When drought conditions are no longer in effect or needed, the drought surcharge is removed from retail utility bills.

9.2.4 Public Education and Outreach

The District maintains a school education program that covers urban and environmental water issues and conditions in the local watershed that includes classroom presentations and instructional assistance. All materials provided meet the State education framework requirements. The District participates with other water agencies in a water awareness poster contest each year and invites students from grades 4-6 to participate. District staff makes class presentations each year to teach water efficiency and conservation as well as provide information about the District’s water treatment plant operations, reaching approximately 1,000 students.

In addition to the classroom presentations, the District and RWA support the Sacramento Bee’s Media in Education (MIE) program. Funded and managed by RWA, the MIE offers state framework water efficiency materials to over 700 classrooms and more than 24,000 students in the greater Sacramento area, including over 8,600 students in the San Juan Water District service area. The District annually monitors the number of events for each category and reports these in the annual CUWCC BMP reports (Appendix H).

In addition, the District:

- Mails out new resident welcome packets with a variety of water efficiency and conservation materials.
- Distributes water efficiency and water conservation information via bill inserts/newsletters/brochures.

- Provides free customer services, water surveys and irrigation troubleshooting from conservation staff.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

The District conducts annual Distribution System Water Audits (consistent with AWWA M36 methodology using software analysis) to characterize water system losses. A copy of the District's recent water audit is contained in Appendix D. The Audit indicated the District has an Infrastructure Leak Index of 1.8 (1.0-3.0 is an acceptable range). Work will be done to improve audit data related to source and customer metering data. Leak detection methods utilized by the District include monitoring of zone usage, zone pressure, and surface conditions. Detected leaks are repaired on an economic basis. The District has a long term Capital Improvement Program (CIP) that involves an annual main line replacement and leak detection survey program. The District plans to validate its water audit data by October 2017 to improve the accuracy of actual measured water losses occurring in the system per AWWA M36 methodology.

The District has an active leak detection program. The District periodically contracts with a qualified electronic leak detection service to survey large sections of the service area infrastructure. Leaks are also detected by field crews and meter readers, customers, and other utilities and public works departments. All leaks are repaired immediately. In 2014, a total of 120 leaks were identified and repaired for an estimated annual savings of approximately 102 AF. The District's five year average non-revenue water has been 9 percent, lower than the 14% ten year average, indicating that District water loss control measures are reducing overall system water losses.

9.2.6 Water Conservation Program Coordination and Staffing Support

The District has the equivalent of 3 FTEs working on DMM planning and implementation efforts. In addition, distribution field services staff, customer service and administrative staff also provide support. The District's conservation coordinator duties and responsibilities include the following:

- Coordination and oversight of conservation program and water efficiency measures.
- Tracking, planning, and reporting CUWCC BMP implementation.
- Coordination of water conservation and efficiency efforts and programs with District executive team, other staff, and other agencies.
- Preparation of annual BMP budgets.
- Participation in CUWCC plenary and committee meetings.
- Preparation of conservation elements in the District' Urban Water Management Plan.

9.2.7 Other Demand Management Measures

The other DMMs the District implements are listed and described below.

Residential Water Audits

- Develop and distribute water efficiency and conservation marketing strategies and outreach materials with the focus on water surveys.
- Promote water surveys to all existing customers at least twice per year through newsletters and notes on customers' bills.
- Provide inspections of irrigation system and timers by appointment.
- Review or develop irrigation schedules per customers' request.
- Provide customer reports that include water survey results as well as efficiency and conservation recommendations.
- At each meter read, usage is evaluated and any abnormal read is investigated. If the read is valid, each customer is contacted and staff assistance is offered. On most occasions, a leak is detected and staff is able to instruct the property owner on repair.

Water Usage Information

In direct response to the drought, the District implemented a software program that notifies customers on the success of their household's water reductions. The program compared their current household's use to of their 2013 use of the same billing period. The report the customer received provided the information in gallons per day. The program also compared the customer's household use to a group of like households scoring the household on their success. The bi-monthly water bills provide a 2 year usage history customers can use to evaluate their water use habits.

Residential Plumbing Retrofits

Although the CUWCC saturation requirement has been met, the District continues to offer kits to customers with high use fixtures. Customers may pick up kits, or if staff is at a property that does not have efficient fixtures in place, a kit is given at that time.

Hot Water On Demand Rebate Program

A hot water recirculation system that moves hot water to fixtures quickly without waiting for the water to get hot. The District offers a \$100 rebate.

HET Rebate Program

A high efficiency toilet (HET) is a toilet that flushes at 1.28 gallons per flush (GPF) or less. HETs use 20% less water than the ultra-low flush toilets. The District offers a \$125 rebate.

Irrigation Efficiency Rebate Program

The irrigation efficiency rebate program reimburses participants of 50% of total material costs. Fifty percent (50%) of the rebate is issued as a bill credit after verification of installation. The

remaining rebate is issued if, after one year, a water savings is achieved. Eligible equipment may include: removal of old irrigation timer and replacement with a weather-based irrigation controller (WBIC) product; conversion of spray irrigation to low volume drip irrigation system; retrofit existing non-efficient spay heads with matching precipitation rate heads; and removal and replacement of leaking irrigation systems. Maximum rebates: residential site is \$500 and commercial site is \$1,500.

HECW Rebate Program

A high efficiency clothes washer (HECW) uses 40% less water than a standard model as determined by CEE. The eligible model list is updated annually. The District offers a \$100 rebate.

Pre-Rinse Spray Nozzle Rebate Program

A high efficiency spray nozzle is used in commercial establishments to pre-rinse dishes. Standard nozzles use 3.0 GPM while high efficiency nozzles use 1.6 GPM or less. The District has offered a \$37.49 rebate in the past, and may implement the program again in the future.

School Education/Public Information

These programs are on-going and a key element of the District's DMM programs. The school program targets elementary age students and teachers including class presentations and materials that are consistent with California curriculum standards. The public information program is comprised of on-going communications including newspaper, radio, bill stuffers, website information, promotions, program literature and materials, and related information as needed to meet DMM program goals.

Implementation of these DMMs over the past five years is described in more detail in Section 9.3.

9.3 Implementation over the Past Five Years

CWC 10631

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

(1)(A) ... a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.

This section requires the supplier to provide a description of all DMMs that have been implemented over the past five years from 2011 through 2015. The District has been actively implementing DMMs over the past five years through both local and regional programs in collaboration with the Regional Water Authority (RWA). A description including budget, narrative, and water savings information follows for DMMs implemented during the 2011-2015 period in accordance with the Act.

9.3.1 Past DMM Expenditures (2011-2015)

Table 9-2 summarizes the District's actual DMM expenditures over the past five years. The DMM budget is established on an annual basis as part of the District's overall annual budget

review and adoption process. The DMM budget can vary from year to year depending on DMM program grant funding availability, water savings goals, DMM program approvals, regional DMM program participation levels, and local response to District DMM programs. The District also has DMM expenditures related to CUWCC and RWA membership dues and participation of approximately \$18,000 per year.

Table 9-2: Past Annual DMM Expenditures Table (2011-2015)					
Program/Item	2011	2012	2013	2014	2015
Public Information/Outreach Program	\$63,284	\$67,420	\$72,733	\$66,737	\$67,400
Customer Rebate Programs (*)	\$78,084	\$51,257	\$54,353	\$63,086	\$46,451
Water Loss Control – Annual Water Audits	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
District Staffing(**)	\$160,800	\$165,500	\$174,250	\$180,000	\$189,500
School Education Program	\$5,745	\$22,000	\$5,793	\$37,200	\$5,790
Total Annual DMM Expenditures	\$312,913	\$311,177	\$312,129	\$352,023	\$314,141
NOTES: 1. (*) = HET, HECW, Irrigation and CII Rebate Programs 2. (**) = Estimated staffing costs for conservation coordinator, field services, customer service, and administrative support.					

The District’s DMM program is designed to meet local and regional water use efficiency objectives, satisfy CUWCC BMPs consistent with Water Forum Agreement provisions, and achieve SBX7-7 future water use targets. The District’s DMM budget and expenditures reflect the challenge in meeting these multiple water use objectives while providing cost-effective service to customers. The District works collaboratively with other agencies to optimize its water use efficiency investments and pursues outside funding sources when available to deliver DMM programs at the lowest possible cost. Over time, the District’s DMM budget may change due to program effectiveness, emerging water saving technologies and devices, and/or saturation of specific DMM programs.

9.3.2 Past DMM Implementation Summary (2011-2015)

Table 9-3 summarizes the District’s other DMM programs implemented over the past five years including local DMM programs in the District service area and regional DMM programs offered in collaboration with RWA. A narrative description of past DMM programs is provided below.

Table 9-3: Past DMM Program Narrative Summary Table (2011-2015)					
Program/Item	2011	2012	2013	2014	2015
Hot Water On Demand Rebate Program	Yes	Yes	Yes	Yes	Yes
HET Rebate Program (1.28 GPF)	Yes	Yes	Yes	Yes	Yes
Irrigation Efficiency Rebate Program (*)	Yes	Yes	Yes	Yes	Yes
ULFT Rebate Program (1.6 GPF)	Yes	Yes	Yes	Yes	No
HECW Rebate Program	Yes	Yes	Yes	Yes	Yes

Table 9-3: Past DMM Program Narrative Summary Table (2011-2015)					
Program/Item	2011	2012	2013	2014	2015
Pre-Rinse Spray Nozzle Rebate Program	No	No	Yes	Yes	No
School Education/Public Information	Yes	Yes	Yes	Yes	Yes
NOTES: 1. (*) = offered to residential and commercial customers.					

DMMs implemented over the past five years have helped the District meet its SBX7-7 interim 2015 water use target of 464 GPCD with 2015 actual water use of only 293 GPCD, in part also due to the State Water Resources Control Board (SWRCB) drought water use reduction regulations.

9.3.3 Past DMM Water Savings (2011-2015)

Table 9-4 summarizes the estimated water savings for the DMMs implemented over the past five years in the District’s service area as described above. The water savings is estimated on both an annual and lifetime (i.e., over the useful life of the device) basis.

Table 9-4: DMM Water Savings Summary Table (2011-2015)						
Savings Period	2011	2012	2013	2014	2015	Total
Annual Water Savings – AF	36	15	17	29	30	127
Lifetime Water Savings – AF	382	161	176	300	317	1,337

The DMM program water savings achieved over the past five years has enabled the District to reliably meet its established water use targets and improve its overall water use efficiency.

9.4 Planned Implementation to Achieve Water Use Targets

CWC 10631

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

(1)(A)... The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

In planning for future DMM programs, the District would consider the following factors: current efficiency level of the customer base, cost-effective program design and implementation, sustainability of water savings, emerging technologies and devices, and ability to meet future water use targets. DMM programs are an important long term strategy to enable the District to provide affordable reliable water service to customers during normal and dry years. While meeting water use targets is important, it isn’t the only consideration in planning future DMM programs. The District would consider the provisions of the CUWCC MOU and Water Forum Agreement.

The District has a 2020 water use target of 413 GPCD in accordance with SBX7-7 calculations completed in Chapter 5. The District's current (2015) demand is 293 GPCD. Maintaining current demand patterns will allow the District to continue to meet the 2020 target, and will require implementation of future DMMs that maintain an efficient customer base and water system. The planned 2016-2020 DMM programs would be tailored to meet this goal. Some of the current DMM programs would be continued during this period, and some new programs could be instituted. A review of various water use target data follows which could influence the process of selecting future DMM programs as follows:

- In 2018, the District is required to meet the CUWCC BMP compliance target of 408 GPCD (based on CUWCC MOU per capita compliance criteria). This target would be updated upon adoption of the District's 2015 UWMP based on the most recent SBX7-7 calculations. The District's per capita water use has varied between 293 GPCD and 529 GPCD over the past ten (10) years. The District would monitor water use carefully and continue DMM programs that meet the target.
- In 2020, the District would need to comply with the SBX7-7 water use target of 413 GPCD. The District's 2015 interim water use target was 464 GPCD. The District met the 2015 interim target in 2015 with actual use of 293 GPCD (in part due to SWRCB water use reduction regulations). Over the past ten (10) years, the District would have met its 2020 water use target only 40% of the time, suggesting that continued DMM implementation is required to reliably meet the District's 2020 water use target.

9.4.1 Planned DMM Budget (2016-2020)

Table 9-5 summarizes the District's base budget (averaging annual expenses from 2011-2015) over the 2016-2020 period. This assumes similar DMM program funding levels with current DMM programs largely continuing. The actual DMM budget over this period could be modified, changing the types of DMM programs funded as well as funding levels. The 2016 DMM expenditures are likely to be similar to the base budget below. For years 2017 through 2020, budget modifications could be instituted by the District based on ability to meet future water use targets and District Board budget approvals.

Table 9-5: Planned Annual DMM Expenditures Table (2016-2020)					
Program/Item	2016	2017	2018	2019	2020
Public Information/Outreach Program	\$67,515	\$67,515	\$67,515	\$67,515	\$67,515
Customer Rebate Programs (*)	\$58,646	\$58,646	\$58,646	\$58,646	\$58,646
Water Loss Control – Annual Water Audits	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
District Staffing(**)	\$174,010	\$174,010	\$174,010	\$174,010	\$174,010
School Education Program	\$15,306	\$15,306	\$15,306	\$15,306	\$15,306
5-Year Avg. Annual DMM Budget	\$320,477	\$320,477	\$320,477	\$320,477	\$320,477
1. (*) = HET, HECW, Irrigation and CII Rebate Programs 2. (**) = Estimated staffing costs for conservation coordinator, field services, customer service, and administrative support.					

The planned DMM budget over the next five years would be influenced by the level of District participation in regional DMM programs, the ability of the District to secure outside funding

sources to defray the future cost of DMM programs, actual participation levels in District DMM programs, and ability to meet future water use targets during the period.

9.4.2 Planned DMM Summary and Narratives (2016-2020)

In planning future DMM programs, evaluating how water is used in the District is insightful in assessing where to target future DMM programs. Table 9-6 indicates the predominant District water user classes based on percent of total demands:

Table 9-6: Planned DMM Programs – Focusing On Largest User Classes			
User Class	% Total Demand	% Indoor	% Outdoor
Single Family Residential (SFR)	85%	40%	60%
Irrigation (IRR)	8%	0%	100%

About 93% of the District’s total water demands are used by the SFR and IRR user classes, with a majority of the use occurring for outdoor (irrigation) purposes. Meeting future water use targets would require these user classes to achieve commensurate water use reduction. Based on District water use patterns, Table 9-7 summarizes the District’s priority and optional DMMs that could be employed to meet future water use targets.

Table 9-7: DMM Narrative Summary Table (2016-2020)					
Priority DMMs	2016	2017	2018	2019	2020
Public Information/Outreach Program	Yes	Yes	Yes	Yes	Yes
School Education Program	Yes	Yes	Yes	Yes	Yes
Landscape Programs – manage outdoor use	Yes	Yes	Yes	Yes	Yes
Water Audits – SFR and IRR accounts (*)	Yes	Yes	Yes	Yes	Yes
Water Loss Control Program – audits/repairs	Yes	Yes	Yes	Yes	Yes
Optional DMMs	2016	2017	2018	2019	2020
Hot Water On Demand Rebate Program	Yes	Opt	Opt	Opt	Opt
HET Rebate Program	Yes	Opt	Opt	Opt	Opt
HECW Rebate Program	Yes	Opt	Opt	Opt	Opt
Pre-Rinse Spray Nozzle Rebate Program	Opt	Opt	Opt	Opt	Opt
NOTES:					
1. (*) = offered to high users only					

Priority DMM Programs:

Public Information/Outreach

DMM literature to all customers, bill inserts, newspaper ads/notices, direct mail, District website, workshops, and handouts available in District offices.

School Education

The school program targets elementary age students and teachers including class presentations and materials which are consistent with California curriculum standards. The District benefits from participation in the regional program with RWA.

Landscape Programs

Consider continuing the Irrigation Efficiency Rebate Program:

Irrigation Efficiency Rebate Program

The irrigation efficiency rebate program reimburses participants of 50% of total material costs. Fifty percent (50%) of the rebate is issued as a bill credit after verification of installation. The remaining rebate is issued if, after one year, a water savings is achieved. Eligible equipment may include: removal of old irrigation timer and replacement with a weather-based irrigation controller (WBIC) product; conversion of spray irrigation to low volume drip irrigation system; retrofit existing non-efficient spray heads with matching precipitation rate heads; and removal and replacement of leaking irrigation systems. Maximum rebates: residential site is \$500 and commercial site is \$1,500.

Water Audits

Offer SFR and Irrigation accounts water audits, targeting the top 10% of users in each user class. Check for leaks, collect meter master data for demand use profile (timing and duration of irrigations, quantify leak losses), conduct irrigation system audits, and recommend irrigation schedule changes. Monitor accounts post-audit to assess effectiveness.

Water Loss Control Program

Continue to conduct annual distribution system water audits using AWWA M36 methodology, validate data by October 2017, conduct system annual leak detection surveys, repair identified leaks, and quantify loss reduction savings. Integrate program with 10-year CIP main replacement schedule and other asset management program elements. Consider periodic condition assessments to determine the condition and reliability of older infrastructure. Identify locations of concern as sources for future leak losses. System leak repairs may require special budgeting depending on magnitude of activities.

Additional Programs For Consideration:

- Additional irrigation scheduling workshops and demonstration sites
- Small scale landscape conversion programs as monitoring/information sites
- Optional water budget program – rates matching use (target Irrigation Accounts)

Optional DMM Programs:

These programs could be offered to high users, offered on a limited basis, continued in their current form, or terminated in lieu of other DMM programs. They are described in section 9.2.7.

DMMs planned to be implemented over the 2016-2020 period will help the District reliably meet its 2020 water use target of 413 GPCD.

9.4.3 Planning For Future DMM Programs

The District may consider the following projects to refine its planning for future DMMs.

1. Conduct a DMM Baseline Study to quantify market saturation of DMMs to date, assess the effectiveness of current DMM programs, identify emerging DMM opportunities and technologies, and identify cost-effective DMM programs that can be implemented during the 2016-2020 period.
2. Evaluate water use of DMM program participants, especially those who have participated in more than one DMM program, to determine actual water savings and cost-effectiveness of DMM programs.
3. Plan for the deployment of an AMI metering system and impact the technology would have on District business practices, DMM programs, and ability to meet future water use targets.
4. Refine landscape reduction measures and policies that would be incorporated into the District's water shortage contingency plan to assure demand reduction targets are achieved for a given stage.
5. Pursue outside sources to fund District DMM programs.

The District will need continued implementation of DMM programs to reliably meet future water use targets. Therefore, optimizing future DMM programs will be an important objective for the District to achieve.

9.5 Members of the California Urban Water Conservation Council

CWC 10631

- (i) *For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivision (f) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California" dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.*

CUWCC Membership

The District joined the California Urban Water Conservation Council (CUWCC) in 1999, a voluntary organization created to develop best management practices to reduce long-term urban water use demands. The Council is made up of water agencies, environmental organizations and other interested stakeholders, all of whom work together to create

progressive water conservation goals that members strive to achieve. As a member, the District is required to submit an annual report on the progress on the District’s conservation goals. The District has regularly been on track with meeting the best management practices agreed upon by stakeholders.

The CUWCC was created to assist in increasing water conservation statewide. In 1991, the CUWCC members generated and signed a Memorandum of Understanding (MOU). The two primary purposes of the MOU are:

- to expedite the state-wide implementation of reasonable water conservation measures in urban areas, and
- to establish assumptions for use in calculating estimates of reliable future water conservation savings resulting from proven and reasonable conservation measures.

The District is also a USBR contractor and as such is required to develop and maintain a water conservation plan consistent with the requirements of the Central Valley Project Act of 1992 and provide annual reports on plan activities. In addition, the District is a member and signatory to the Water Forum Agreement in the Sacramento region. This agreement includes requirements for urban demand management measures and programs. Both the USBR and the Water Forum allow the CUWCC MOU methods of compliance, including bi-annual reporting, to satisfy the requirements of their agreements.

Best Management Practice (BMP) Reporting

The District has utilized both wholesale and retail water conservation BMPs to reduce water demands, thereby reducing the water supply needed to meet customer water demands. The District regularly files BMP reports with the CUWCC indicating the implementation level for various BMPs over time. CUWCC members have the option of submitting their 2013/2014 BMP reports in lieu of describing their DMM program in the UWMP. The District has elected to submit their BMP reports and provide a narrative summary of DMM programs.

Table 9-8 is a summary of the District’s BMP reporting since its 2010 UWMP was filed.

Table 9-8: Historic CUWCC BMP Reporting	
Year	Annual BMP Report Submitted
2011	Yes
2012	Yes
2013	Yes
2014	Yes

The District plans to continue filing BMP reports with the CUWCC on a regular basis. Copies of the District’s 2011 through 2014 BMP reports submitted to the CUWCC are included in Appendix H.

Compliance With CUWCC BMPs

The District has a proven history in meeting utility based BMPs related to metering, metered rates, DMM staffing, water loss control, water waste enforcement, and asset management. The District will continue to comply with these DMMs and focus programmatic DMM implementation on meeting future water use targets on a reliable basis.

Water Use Target – BMP Compliance

The District (as indicated in their 2010 BMP Coverage Report) indicated a desire to comply with BMPs in the future using the gallons per capita per day (GPCD) target method. Table 9-9 summarizes the criteria since the 2010 UWMP cycle.

Table 9-9: BMP Reports Using GPCD Target Method	
Year	BMP Compliance GPCD Target
2010	480
2012	462
2014	444
2016	426
2018	408

Over the past ten years the District would have met the 2018 target 40% of the time. The 2016 and 2018 GPCD targets will be updated in the next BMP reporting cycle based on the updated SBX7-7 analysis completed in this UWMP. The District plans to implement DMMs in the future to ensure compliance with its SBX7-7 2020 water use target.

Chapter 10: Plan Adoption, Submittal, and Implementation

This chapter describes the District's actions to meet the requirements of the Act pertaining to public review and availability. The District must provide at least 60-day notice prior to changing or adopting the plan, must conduct a public hearing prior to adoption, must properly notice the public hearing, must make the UWMP document available for public review, and make the final adopted plan available to the public, cities and counties, and DWR within 30-days of adoption. Further, the adopted plan must be submitted to DWR, cities and counties, and State Library within 30-days of adoption and discuss plan implementation.

10.1 Inclusion of All 2015 Data

The District is reporting on a calendar year basis and has included all water use and planning data for the entire 2015 calendar year. The District's Distribution System Water Audit was based on calendar year 2014 data and information, followed the AWWA M36 methodology, and used the AWWA Water Audit Software (version 5.0) to conduct the water audit in accordance with 2015 UWMP requirements.

10.2 Notice of Public Hearing

The District held a public hearing prior to adopting its 2015 UWMP to provide the public with an opportunity to review and comment on the District's 2015 UWMP. The two main audiences to be noticed are cities and counties, and the public. The District's efforts to properly notice its public hearing are described below.

10.2.1 Notice to Cities and Counties

CWC 10621

(b) Every urban water supplier required to prepare a plan shall... at least 60 days prior to the public hearing on the plan ... 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.

CWC 10642

...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.

Notifications indicating preparation of the 2015 UWMP were provided to cities and counties within SJWD's wholesale and retail service area at least 60 days in advance of the public hearing as required by the Act. Cities and counties were also notified of the time and place of the public hearing. Appendix C contains the notifications and follow-up correspondence provided to cities and counties. The following cities and counties were notified as indicated in Table 10-1.

Table 10-1: Wholesale and Retail: Notification to Cities and Counties

<input type="checkbox"/>	Supplier has notified more than 10 cities or counties in accordance with CWC 10621 (b) and 10642. Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.	
<input checked="" type="checkbox"/>	Supplier has notified 10 or fewer cities or counties. Complete the table below.	
City Name	60 Day Notice	Notice of Public Hearing
Citrus Heights	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fair Oaks	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Folsom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Roseville	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
County Name	60 Day Notice	Notice of Public Hearing
Placer County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sacramento County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
NOTES: 1. Notification list and letter is included in Appendix A.		

10.2.2 Notice to the Public

CWC 10642
...Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection... .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...

Government Code 6066
Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.

The District conducted a Public Hearing on May 25, 2016 prior to adopting its 2015 UWMP on June 8, 2016. The District filed two legal public notices in the Sacramento Bee, including time and place, to inform the public of the upcoming Public Hearing and to make the 2015 UWMP available for public review and comment. The first notice was published on May 4, 2016 and the second notice was published on May 11, 2016. The District also published a notice to the public about the upcoming Public Hearing on its website (www.sjwd.org). A copy of the public notice filed in the Sacramento Bee is included in Appendix C.

10.3 Public Hearing and Adoption

CWC 10642

...Prior to adopting a plan, the urban water supplier shall hold a public hearing thereon.

CWC 10608.26

- (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:*
- (1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.*
 - (2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.*
 - (3) Adopt a method, pursuant to subdivision (b) of Section 10608.20 for determining its urban water use target.*

The District conducted a Public Hearing, held at the District Board Room in Granite Bay, California, on May 25, 2016 prior to adopting its 2015 UWMP. The purpose of the Public Hearing was to allow community input regarding the District's implementation plan, to consider the economic impacts of the District's implementation plan, and to adopt a method for complying with SBX7-7 for determining its urban water use target. The Public Hearing was opened and closed, with public comments documented and considered for inclusion into the 2015 UWMP.

10.3.1 Adoption

CWC 10642

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

The District conducted a Public Hearing on May 25, 2016 regarding its 2015 UWMP to receive public comment on the plan before adoption. The District considered the public comments received at the Public Hearing in the Final 2015 UWMP adopted by the District Board at its June 8, 2016 meeting. A copy of the Board resolution adopting the 2015 UWMP is included in Appendix I.

10.4 Plan Submittal

CWC 10621

(d) An urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

CWC 10644

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

CWC 10635

(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.

A copy of SJWD's Final 2015 UWMP shall be submitted to DWR, the California State Library, and any city or county within the supplier's service area before July 8, 2016 (within 30 days after adoption).

10.4.1 Electronic Data Submittal to DWR

SJWD will submit the adopted 2015 UWMP to DWR through the DWR online submittal process, including completed DWR Tables within 30-days of when the 2015 UWMP was adopted by the SJWD Board. The DWR Tables not used within the body of this Plan can be found in Appendix J.

10.4.2 Submittal to the California State Library and Cities and Counties

SJWD will submit a copy of its adopted 2015 UWMP to the California State Library and all cities and counties receiving water service through wholesale or retail service within 30-days of adopting its 2015 UWMP.

10.5 Public Availability

CWC 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.

The District's adopted Final 2015 UWMP was made available to the public in hard copy at the District's Administration Office located at 9935 Auburn Folsom Road, Granite Bay, California, 95746. The District's Final 2015 UWMP was also made available to the public on the District's website within 30-days after adoption by the District's Board. This plan includes all information necessary to meet the applicable requirements of California Water Code.

10.6 Implementation

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

The District is committed to the implementation of its 2015 UWMP as indicated with a proven commitment to funding and implementing DMM programs to improve long term water use efficiency and manage its limited resources. The District has dedicated staff responsible for planning and implementing District DMM programs. In addition, the District is committed to regional collaboration as indicated by its long term membership with the California Urban Water Conservation Council's and Regional Water Authority.

The District is committed to implementation of the projects, plans, and discussions provided within this document. Importantly the execution of the plan is contingent upon the approval of annual budgets, level of DMM program participation, impact of regional collaborative efforts, availability of outside funding sources, and policy and regulatory factors that may influence DMM implementation over time. This document presents the water supply, reliability, DMM, and water shortage planning programs known to be in effect at the time of plan adoption.

The District will also be considering SBX7-7 water use targets, emerging water conservation technologies, baseline studies to determine DMM effectiveness, and better defining the role of DMM programs in managing limited supplies during dry conditions. The District will continue to play an active role in regional water planning processes, promote the efficient use of water supplies, and support steps to procure local reliable resources wherever feasible and cost-effective to maintain long term supply reliability.

The District will be evaluating existing DMM programs and refining future efforts when necessary to improve DMM program cost effectiveness and savings reliability. The District will also be open to increasing the breadth of DMM program through partnerships with other water suppliers, energy utilities, and other agencies in the region that support DMM programs.

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Appendix A

2015 Urban Water Management Plan Checklist

Appendix A: UWMP Checklist

This checklist is developed directly from the Urban Water Management Planning Act and SB X7-7. It is provided to support water suppliers during preparation of their UWMPs. Two versions of the UWMP Checklist are provided – the first one is organized according to the California Water Code and the second checklist according to subject matter. The two checklists contain duplicate information and the water supplier should use whichever checklist is more convenient. In the event that information or recommendations in these tables are inconsistent with, conflict with, or omit the requirements of the Act or applicable laws, the Act or other laws shall prevail.

Each water supplier submitting an UWMP can also provide DWR with the UWMP location of the required element by completing the last column of either checklist. This will support DWR in its review of these UWMPs. The completed form can be included with the UWMP.

If an item does not pertain to a water supplier, then state the UWMP requirement and note that it does not apply to the agency. For example, if a water supplier does not use groundwater as a water supply source, then there should be a statement in the UWMP that groundwater is not a water supply source.

Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location <i>(Optional Column for Agency Use)</i>
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	Section 2.1
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	Section 2.5.2
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	Appendix B
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	Section 3.1 and 3.2
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	Section 3.3
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	Section 3.4
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	Section 3.4.1
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	Section 3.4, Appendix D
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	Section 4.2
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	Section 4.3

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	Section 4.4
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	Section 5.7, Appendix F
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5 and App E	Chapter 5, Appendix F
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	Section 5.7.1
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	Section 5.8
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	Section 5.8.1
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	Section 9.1
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	Section 5.8, Appendix F
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	Section 6.3, 6.8 and 6.9

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	Section 6.2
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	Section 6.2.2
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	Section 6.2.1
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	Section 6.2.2
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	Section 6.2.1 and 6.2.3
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	Section 6.2
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	Section 6.2
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	Section 6.7
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	Section 6.7 and 6.8

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	Section 6.6
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	Section 2.5.1
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	Section 2.5.2 and Appendix B
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	Section 6.5.1
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	Section 6.5.2
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	Section 6.5.2
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	Section 6.5.4
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	Section 6.5.4
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of	System Supplies (Recycled Water)	Section 6.5.4	Section 6.5.4

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
	recycled water in comparison to uses previously projected.			
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	Section 6.5.5
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	Section 6.5.5
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	Section 6.1
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	Section 7.1 and 7.2
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	Section 7.2
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	Section 7.3.2 and 7.3.3
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	Section 6.3
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	Section 7.3
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	Section 8.1

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	Section 8.9
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	Section 8.8
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	Section 8.2
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	Section 8.4
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	Section 8.3
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	Section 8.6
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	Section 8.7, Appendix G
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	Section 8.5
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	Section 9.3

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	Section 9.1
10631(i)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	Section 9.5, Appendix H
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	Section 10.3
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	Section 10.2.1
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	Sections 10.3.1 and 10.4
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	Section 10.4
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	Section 10.5, Appendix B
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	Section 10.2, Appendix B

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Section 10.3.1, Appendix C
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	Section 10.4.2, Appendix I
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	Section 10.4.2, Appendix I
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	Section 10.4.1
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	Section 10.5

Appendix B

Documentation of Water Use Projections Submittal

30 March 2016

Memorandum

To: RecipientName

From: Keith Durkin, Assistant General Manager
San Juan Water District

Subject: San Juan Water District 2015 Urban Water Management Plan
Supply Reliability and Projections
K/J 1570026*00 / 6.03

San Juan Water District (SJWD) is currently in the process of preparing its 2015 Urban Water Management Plan (UWMP) as required by State of California Law through the Urban Water Management Planning Act. SJWD obtains its water supply from surface water through Folsom Lake. The purpose of this memorandum is to provide SJWD's wholesale customer agencies with preliminary information for use in the development of their 2015 UWMPs and to request information SJWD needs to complete its UWMP as a wholesale provider.

This memo includes the following SJWD preliminary information:

- SJWD water supply sources
- SJWD water supply reliability

And requests the following information from wholesale customer agencies:

- Population projections
- Demand projections

The information provided in this memorandum is preliminary and may be different from what is presented in the adopted 2015 UWMP. If you have any questions or concerns please feel free to contact Mike Downey with Kennedy/Jenks Consultants at mikedowney@kennedyjenks.com or (916) 858-2732.

Memorandum

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SJWD Water Supply Sources

The following DWR tables represent SJWD’s projected water supply information.

Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs						
<input checked="" type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
<input type="checkbox"/>	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
	Y/N	Agency Name?				
NOTES:						

Table 6-8 Wholesale: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield
Surface water	USBR CVP Folsom Lake	796	Raw Water	24,200
Surface water	Pre-1914 Right	33,000	Raw Water	33,000
Surface water	Placer County Water Agency	10,000	Raw Water	25,000
Total		43,796		82,200
NOTES:				
(a) USBR CVP Folsom Lake contract water is subject to CVP M&I Water Shortage Policy and 2015 supplies were reduced to 50% of historical use of CVP supply as calculated by USBR. According to USBR, San Juan's historical use of CVP supply is 1,593 AF (USBR, 2/24/2015). (b) In 2015, Folsom Reservoir inflow was projected to be below 400,000 AFY. Therefore the District's PCWA contract supply was reduced to 10,000 AF. (c) Supply volume in units of AF.				

Table 6-9 Wholesale: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply <i>Report To the Extent Practicable</i>									
		2020		2025		2030		2035		2040 (opt)	
		Reasonably Available Volume	Total Right or Safe Yield	Available Volume	Total Right	Available Volume	Total Right	Available Volume	Total Right	Available Volume	Total Right
Surface water	USBR CVP Folsom Lake	24,200	24,200	24,200	24,200	24,200	24,200	24,200	24,200	24,200	24,200
Surface water	Pre-1914 Right	33,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000
Surface water	Placer County Water Agency	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Total		82,200	82,200	82,200	82,200	82,200	82,200	82,200	82,200	82,200	82,200
<p>NOTES:</p> <p>1. Projected water supply is for a normal year (Folsom Reservoir inflow projected above 950,000 AF).</p> <p>2. Units are in AFY</p>											

Water Supply Reliability

The following tables relate to reliability of SWJD water supplies.

Table 7-1 Wholesale: Basis of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		Agency may provide volume only, percent only, or both	
		Volume Available	% of Average Supply
Average Year		82,200	100%
Single-Dry Year	1977	61,150	74%
Multiple-Dry Years 1st Year	1990	61,150	74%
Multiple-Dry Years 2nd Year	1991	55,100	67%
Multiple-Dry Years 3rd Year	1992	55,100	67%
<i>Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately.</i>			
<p>NOTES:</p> <ol style="list-style-type: none"> 1. Volume available is based on District water supply contracts only and does not include reductions due to Water Forum Agreement. 2. Average year assumes 100 percent availability of Water Right supply and contract supplies (Folsom Reservoir projected inflow greater than 950,000 AFY). 3. For the purposes of this analysis, it is assumed that historical USBR CVP Folsom Lake usage is equal to the full contract amount. 4. The single- and first multiple-dry years assume Folsom Reservoir inflow projected to be between 400,000 and 950,000 AFY: 100 percent availability of Water Right supply, 75 percent availability of full USBR CVP Folsom Lake contract supply, and 100 percent availability of PCWA contract supply. 5. The second and third multiple-dry years assume Folsom Reservoir inflow projected to be below 400,000 AFY: 100 percent availability of Water Right supply, 50 percent availability of full USBR CVP Folsom Lake contract supply, and 10,000 AF of PCWA contract supply. 6. Volume is in AFY. 			

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Table 7-2 Wholesale: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	82,200	82,200	82,200	82,200	82,200
Demand totals	29,848	65,239	70,750	76,475	82,200
Difference	52,352	16,961	11,450	5,725	0

NOTES: Demand projections are preliminary estimates, and will be updated based on projected demands provided by wholesale customer agencies.

1. Supply and demand volumes are in AFY.
2. Average year assumes 100 percent availability of Water Right supply and contract supplies (based on Sacramento Water Forum definition of Folsom Reservoir inflow projected above 950,000 AF).
3. Demands are the total retail and wholesale service area demands as projected in Chapter 4 Tables 4-2a and 4-3a and include future conjunctive use program.

The following assumptions are made for calculating supply and demand during single- and multiple-dry year scenarios. Demand projections are preliminary estimates, and will be updated based on projected demand provided wholesale customer agency.

1. Assume that Folsom Reservoir inflows are projected to be between 400,000 AFY and 950,000 AFY (non-Conference years). SJWD intends on complying with the Water Forum Agreement, which can reduce total surface water diversion in proportion to the water level in Folsom Lake to a minimum of 54,200 AFY. Therefore, it is assumed that available supply will be the minimum of 54,200 AFY. The decrease in diversion amounts will be met by a combination of reductions of PCWA and USBR CVP supply, both contractually and at the District’s discretion.
2. Water supply will not be available for the City of Roseville or for conjunctive use during a single dry year.
3. Assume that District’s retail service area water demands will meet SBX7-7 objectives through implementation of demand management measures described in Chapter 9.
4. The District retail water service area and wholesale customer agencies (including SJWD retail) will implement their respective Water Shortage Contingency Plans (WSCPs).

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5. If the supply-demand balance shows a shortage, wholesale customers with groundwater supplies (FOWD and CHWD) will increase groundwater pumping to offset surface water supply.

SSWD groundwater will be provided to the SJWD through the Antelope Pump-Back Booster Station. This supply is only intended to be activated during dry years or when SJWD's surface water supplies are reduced. SSWD groundwater is estimated to provide an additional 5,300 AFY.

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Table 7-A: Single Dry Year Supply and Demand Calculations					
	2020	2025	2030	2035	2040
Existing Supply Contracts					
Pre 1914 Rights	33,000	33,000	33,000	33,000	33,000
USBR CVP Folsom Lake Contract	24,200	24,200	24,200	24,200	24,200
PCWA Contract	25,000	25,000	25,000	25,000	25,000
Total Supply Contracts	82,200	82,200	82,200	82,200	82,200
Dry Year Supply Reductions					
Water Forum Agreement Maximum Reductions ^(a)	-28,000	-28,000	-28,000	-28,000	-28,000
Total Existing Supplies	54,200	54,200	54,200	54,200	54,200
Demand					
Wholesale Agency Demand w/o Conservation ^(b)	56,569	59,776	62,556	65,550	68,544
20x2020 Reduction in Retail Demand ^(c)	-1,596	-1,688	-1,767	-1,852	-1,938
Reduction from WSCP ^(d)	-8,246	-8,713	-9,118	-9,555	-9,991
Demand w/ Conservation	46,726	49,375	51,671	54,143	56,616
Supply-Demand Balance					
Supply-Demand Balance	7,474	4,825	2,529	57	-2,416
Supplemental Groundwater					
Additional Wholesale Groundwater Pumping ^(e)	0	0	0	0	2,416
Antelope Booster Pump-Back Station Groundwater (SSWD) ^(f)	0	0	0	0	0
Total Supplemental Groundwater	0	0	0	0	2,416
<p>NOTES: Demand projections are preliminary estimates, and will be updated based on projected demand provided wholesale customer agency.</p> <p>a. SJWD is a signatory to the Water Forum Agreement which can reduce total surface water diversion in proportion to the water level in Folsom Lake to as low as 54,200 AF.</p> <p>b. Projected wholesale water demands from Chapter 4, Table 4-3a.</p> <p>c. Reduction needed to meet retail SBX7-7 compliance calculated in Chapter 5.</p> <p>d. 15 percent reductions from wholesale demand with SBX7-7 compliance by implementing WSCP Stage 3. See Chapter 8, Water Shortage Contingency Planning.</p> <p>e. Groundwater supply from Wholesale Customer Agencies used to replace surface water supply reductions per the Water Forum Agreement and the WSCP in Chapter 8.</p> <p>f. SSWD groundwater via the Antelope Booster Pump-Back Station is intended to be provided during the summer months in dry years or when SJWD's surface water supplies are reduced.</p>					

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Table 7-3 and 7-4 summarize single-dry year and multiple-dry year supply and demand as described in Table 7-3 above.

Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	54,200	54,200	54,200	54,200	54,200
Demand totals	46,726	49,375	51,671	54,143	56,616
Difference	7,474	4,825	2,529	57	(2,416)
<p>NOTES: Demand projections are preliminary estimates, and will be updated based on projected demand provided wholesale customer agency.</p> <ol style="list-style-type: none"> 1. Supply and demand volumes are in AFY. 2. Dry year supply is based on the Water Forum Agreement, which reduces SJWD Folsom Lake diversions in proportion to lake levels to a minimum of 54,000 AF. Reduction will be met by a combination of reductions of PCWA and USBR CVP supply, both contractually and at the District's discretion. 3. Demands are the total retail and wholesale service area demands as projected in Chapter 4 Tables 4-2a and 4-3a and include retail water use reductions to meet SBX7-7, and implementation of WSPPs. Demand does not include conjunctive use. 4. Supply shortfall is expected to be met by supplemental groundwater pumping by SJWD Wholesale Customer Agencies with pumping capability and SSWD groundwater via the Antelope Pump-Back Booster Station. 					

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Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	54,200	54,200	54,200	54,200	54,200
	Demand totals	46,726	49,375	51,671	54,143	56,616
	Difference	7,474	4,825	2,529	57	(2,416)
Second year	Supply totals	54,200	54,200	54,200	54,200	54,200
	Demand totals	46,726	49,375	51,671	54,143	56,616
	Difference	7,474	4,825	2,529	57	(2,416)
Third year	Supply totals	54,200	54,200	54,200	54,200	54,200
	Demand totals	46,726	49,375	51,671	54,143	56,616
	Difference	7,474	4,825	2,529	57	(2,416)

NOTES: Demand projections are preliminary estimates, and will be updated based on projected demand provided wholesale customer agency.

- Supply and demand volumes are in AFY.
- Assumes Folsom Reservoir projected inflows to be between 400,000 AFY and 950,000 AFY (non-Conference years): the Water Forum Agreement reduces SJWD Folsom Lake diversions in proportion to lake levels to a minimum of 54,000 AF. Reduction will be met by a combination of reductions of PCWA and USBR CVP supply, both contractually and at the District's discretion.
- Demands are the total retail and wholesale service area demands as projected in Chapter 4 Tables 4-2a and 4-3a and include retail water use reductions to meet SBX7-7, and implementation of WSCPs. Demand does not include conjunctive use.
- Supply shortfall is expected to be met by supplemental groundwater pumping by SJWD Wholesale Customer Agencies with pumping capability and SSWD groundwater via the Antelope Pump-Back Booster Station.

Information Requested

SJWD requests the following information to accurately describe wholesale customer agency projections which affect supply and demand comparison and reliability analyses.

Table 3-1 Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040(opt)

NOTES:

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SJWD only requests the **total** projected water use per wholesale customer agency service area. DWR Table 4-2 is where wholesale customer agencies will report demand projections in their individual UWMPs.

Table 4-2 Retail: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description	Projected Water Use				
		2020	2025	2030	2035	2040-opt
Single Family						
Multi-Family						
Commercial						
Institutional / Governmental						
Landscape						
Other						
Losses						
Agricultural irrigation						
TOTAL						
NOTES: Projected Water Use in units of AFY.						

cc: Lisa Brown, San Juan Water District
 Mike Downey, Kennedy/Jenks Consultants

Appendix C

Public Hearing Notice, Notifications, and Meeting Minutes

San Juan Water District sent letters to the following agencies:

Sacramento Regional Sanitation District
10060 Goethe Road
Sacramento CA 95827
Attn: Stan Dean, District Engineer

City of Citrus Heights
7929 Auburn Blvd
Citrus Heights, CA 95610
Attn: Henry Tingle

Placer County Water Agency
PO Box 6570
144 Ferguson Road
Auburn, CA 95604
Attn: Einar Maisch, General Manager

County of Sacramento
Department of Water Resources
827 7th Street, #301
Sacramento, CA 95814
Attn: Kerry Schmitz, Division Chief

Citrus Heights Water District
6230 Sylvan Rd
Citrus Heights, CA 95610
Attn: Robert Churchill, General Manager

County of Placer
175 Fulweiler Ave
Auburn, CA 95603
Attn: David Boesch, CEO

Orange Vale Water Company
PO Box 620800
9031 Central Ave
Orangevale, CA 95662-0800
Attn: Sharon Wilcox, General Manager

Placer County Planning Department
3091 County Center Dr
Auburn, CA 95603
Attn: Paul Thompson, Deputy Planning Director

Fair Oaks Water District
10317 Fair Oaks Blvd
Fair Oaks, CA 95628-5723
Attn: Tom Gray, General Manager

County of Sacramento
Department of Community Development
827 7th Street, #230
Sacramento, CA 95814
Attn: Lori Moss, Director

City of Folsom
50 Natoma St
Folsom, CA 95630-2696
Attn: Evert Palmer



Directors

Dave Peterson
Edward J. "Ted" Costa
Kenneth H. Miller
Pamela Tobin
Bob Walters

General Manager

Shauna Lorance

February 10, 2016

Organization
Address
Attn: Addressee

Re: San Juan Water District 2015 Urban Water Management Plan Update

Addressee,

San Juan Water District is currently preparing the District's 2015 Urban Water Management Plan (UWMP) Update. The UWMP update is scheduled to be submitted on July 1, 2016. If you are interested in coordinating the development of the plan or wish to review the plan in draft prior to submittal, please contact me.

Sincerely,

Lisa Brown
Customer Service Manager
916-791-6948

San Juan Water District sent letters to the following agencies on 4/22/16:

Sacramento Regional Sanitation District
Department of Policy and Planning
10060 Goethe Road
Sacramento CA 95827
Attn: Dave Ocenosak

City of Citrus Heights
7929 Auburn Blvd
Citrus Heights, CA 95610
Attn: Henry Tingle

Placer County Water Agency
PO Box 6570
144 Ferguson Road
Auburn, CA 95604
Attn: Einar Maisch, General Manager

County of Sacramento
Department of Water Resources
827 7th Street, #301
Sacramento, CA 95814
Attn: Kerry Schmitz, Division Chief

Citrus Heights Water District
6230 Sylvan Rd
Citrus Heights, CA 95610
Attn: Robert Churchill, General Manager

County of Placer
175 Fulweiler Ave
Auburn, CA 95603
Attn: David Boesch, CEO

Orange Vale Water Company
PO Box 620800
9031 Central Ave
Orangevale, CA 95662-0800
Attn: Sharon Wilcox, General Manager

Placer County Planning Department
3091 County Center Dr
Auburn, CA 95603
Attn: Paul Thompson, Deputy Planning Director

Fair Oaks Water District
10317 Fair Oaks Blvd
Fair Oaks, CA 95628-5723
Attn: Tom Gray, General Manager

County of Sacramento
Department of Community Development
827 7th Street, #230
Sacramento, CA 95814
Attn: Lori Moss, Director

City of Folsom
50 Natoma St
Folsom, CA 95630-2696
Attn: Marcus Yasutake

City of Roseville
2005 Hilltop Circle
Roseville, CA 95747
Attn: Richard Plecker, Environmental Utilities
Director



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

City of Roseville
2005 Hilltop Circle
Roseville, CA 95747
Attn: Richard Plecker, Environmental Utilities Director

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Rich:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

A public hearing to solicit comments on the draft plan will be held at 7 pm on Wednesday, May 25, 2016 and will take place at:

San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,

A handwritten signature in black ink, appearing to read "LB", is written over the word "Sincerely,".

Lisa Brown

Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

County of Sacramento
Department of Community Development
827 7th Street, #230
Sacramento, CA 95814
Attn: Lori Moss, Director

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Lori:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

A public hearing to solicit comments on the draft plan will be held at 7 pm on Wednesday, May 25, 2016 and will take place at:

San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,

A handwritten signature in black ink, appearing to be "LB" with a flourish, written over the word "Sincerely,".

Lisa Brown
Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

Placer County Planning Department
3091 County Center Dr
Auburn, CA 95603
Attn: Paul Thompson, Deputy Planning Director

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Paul:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

A public hearing to solicit comments on the draft plan will be held at 7 pm on Wednesday, May 25, 2016 and will take place at:

San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,


Lisa Brown
Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

County of Placer
175 Fulweiler Ave
Auburn, CA 95603
Attn: David Boesch, CEO

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear David:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

A public hearing to solicit comments on the draft plan will be held at 7 pm on Wednesday, May 25, 2016 and will take place at:

San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,

Lisa Brown
Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorance

April 22, 2016

County of Sacramento
Department of Water Resources
827 7th Street, #301
Sacramento, CA 95814
Attn: Kerry Schmitz, Division Chief

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Kerry:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

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San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,

A handwritten signature in black ink, appearing to be "LB" or similar initials, written over the word "Sincerely,".

Lisa Brown
Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

City of Citrus Heights
7929 Auburn Blvd
Citrus Heights, CA 95610
Attn: Henry Tingle, City Manager

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Henry:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

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San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,

Lisa Brown

Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

City of Folsom
50 Natoma Street
Folsom, CA 95630-2696
Attn: Marcus Yasutake, Director Environmental & Water Resources

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Marcus:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

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9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,

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Lisa Brown
Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

Fair Oaks Water District
10317 Fair Oaks Blvd
Fair Oaks, CA 95628-5723
Attn: Tom Gray, General Manager

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Tom:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

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Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,


Lisa Brown
Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

Orange Vale Water Company
PO Box 620800
9031 Central Ave
Orangevale, CA 95662-0800
Attn: Sharon Wilcox, General Manager

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Sharon:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

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9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,

Lisa Brown

Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95610
Attn: Robert Churchill, General Manager

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Bob:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

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San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,


Lisa Brown
Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorange

April 22, 2016

Placer County Water Agency
PO Box 6570
144 Ferguson Road
Auburn, CA 95604
Attn: Einar Maisch, General Manager

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Einar:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

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San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,


Lisa Brown
Customer Service Manager



Directors
Edward J. "Ted" Costa
Kenneth H. Miller
Dan Rich
Pamela Tobin
Bob Walters
General Manager
Shauna Lorance

April 22, 2016

Sacramento Regional Sanitation District
Department of Policy and Planning
10060 Goethe Road
Sacramento, CA 95827
Attn: Dave Ocenosak

Re: Notification of Public Hearing for the 2015 Urban Water Management Plan for San Juan Water District

Dear Dave:

San Juan Water District is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. The plan is now available on the District's website at sjwd.org and a copy is available for public review prior to the public hearing and can be reviewed during normal business hours.

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San Juan Water District
9935 Auburn Folsom Road
Granite Bay, CA 95746

If you have any questions please contact me at 916.791.6948.

Sincerely,

Lisa Brown

Customer Service Manager

The Sacramento Bee

P.O. Box 15779 • 2100 Q Street • Sacramento, CA 95852

**SAN JUAN WATER DISTRICT
9935 AUBURN FOLSOM BLVD
GRANITE BAY, CA 95746**

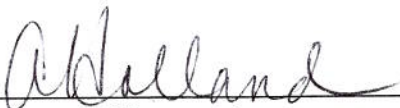
DECLARATION OF PUBLICATION
(C.C.P. 2015.5)

COUNTY OF SACRAMENTO
STATE OF CALIFORNIA

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the printer and principal clerk of the publisher of The Sacramento Bee, printed and published in the City of Sacramento, County of Sacramento, State of California, daily, for which said newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sacramento, State of California, under the date of September 26, 1994, Action No. 379071; that the notice of which the annexed is a printed copy, has been published in each issue thereof and not in any supplement thereof on the following dates, to wit:

May 4, 11, 2016

I certify (or declare) under penalty of perjury that the foregoing is true and correct and that this declaration was executed at Sacramento, California, on **May 11, 2016**



(Signature)

NO 835 PUBLIC NOTICE

NOTICE of Public Hearing

NOTICE IS HEREBY GIVEN that the Board of the San Juan Water District will be holding a public hearing.

Where: Board Chambers, 9935 Auburn Folsom Road, Granite Bay, CA 95746

When: May 25, 2016 at 7:00 pm, or soon thereafter

Purpose: To solicit input regarding the San Juan Water District's 2015 Urban Water Management Plan

Representatives will be available to respond to questions. The draft of the 2015 Urban Water Management Plan is available for review at the San Juan Water District at 9935 Auburn Folsom Road, Granite Bay, CA 95746 between the hours of 8:30 am and 5 pm and on the website at www.sjwd.org.

All persons interested in this matter should appear at the May 25, 2016 Board meeting. Written statements may be submitted in advance for presentation to the Board as part of the public hearing.

Questions should be directed to Lisa Brown, Customer Service Manager at 916-791-6948.

Dated: April 20, 2016

**SAN JUAN WATER DISTRICT
BOARD MEETING AGENDA
May 25, 2016
7:00 p.m.
9935 Auburn Folsom Road
Granite Bay, CA 95746**

The Board may take action on any item on the agenda, including items listed on the agenda as information items. The Board may add an item to the agenda (1) upon a determination by at least three Board members that an emergency situation exists, or (2) upon a determination by at least four Board members (or by three Board members if there are only three Board members present) that the need to take action became apparent after the agenda was posted.

The public may address the Board concerning an agenda item either before or during the Board's consideration of that agenda item. Public comment on items within the jurisdiction of the Board is welcome, subject to reasonable time limitations for each speaker. Upon request, agenda items may be moved up to accommodate those in attendance wishing to address that item. Please inform the General Manager. Times on the agenda are estimates, and items may be discussed at a different time than listed.

Documents and materials that are related to an open session agenda item that are provided to the District Board less than 72 hours prior to a regular meeting will be made available for public inspection and copying at the District office during normal District business hours.

In compliance with the American's with Disabilities Act, if you have a disability and need a disability-related modification or accommodation to participate in this meeting, please contact the Board Secretary at 916-791-0115. Requests must be made as early as possible, and at least one full business day before the start of the meeting.

ESTIMATED TIMES

7:00 p.m.

I. PRESENTATION

1. Poster Contest Winners – President Pam Tobin

7:05 p.m.

II. PUBLIC HEARING

1. 2015 Urban Water Management Plan

- Open the Public Hearing
- Confirmation of Required Notice by Law – Shauna Lorance
- Confirmation of Written Comments/Protests – Shauna Lorance
- Staff Presentation – Lisa Brown
- Public Comment
- Close the Public Hearing

7:20 p.m.

III. PUBLIC FORUM

During the Public Forum, the Board may briefly respond to statements made or questions posed by the public, or ask District staff for clarification, refer the matter to District staff or ask District staff to report back at a future meeting. The Board will not take action on any matter raised during the Public Forum, unless the Board first makes the determinations to add the matter to the agenda.

7:25 p.m.

IV. CONSENT CALENDAR

All items under the Consent Calendar are considered to be routine and will be approved by one motion. There will be no separate discussion of these items unless a member of the Board, Audience, or Staff request a specific item removed after the motion to approve the Consent Calendar.

1. Minutes of the Board of Directors Meeting, May 11, 2016

Recommendation: Approve draft minutes

2. 2016 Proposed CSDA Bylaws Amendments

Recommendation: Affirmative vote on proposed bylaws amendments

ACTION AND INFORMATIONAL ITEMS

7:30 p.m.

V. OLD BUSINESS

1. Board Meeting Time Change

Action: Consider a motion to adopt Resolution 16-08 to change the time of the Board of Directors meetings

VI. COMMITTEE REPORTS

1. Legal Affairs Committee (5/17/16)

- 1.1 FO-40 Agreement on Payment Schedule (W)
- 1.2 Groundwater Reimbursement Payment Schedule Agreement (W)
- 1.3 Water Rate Restructuring Legal Constraints (W & R)
- 1.4 Ordinance Review (W & R)
- 1.5 Other Legal Affairs Matters
 - 1.5.1 Measure A – Water Rights
- 1.6 Public Comment

7:50 p.m.

VII. INFORMATION AND ACTION ITEMS

1. General Manager's Report

- 1.1 State Water Resources Control Board Conservation Requirements
Verbal update on May 18 SWRCB meeting
For information, no action requested
- 1.2 Update on US Bureau of Reclamation Operations
Verbal update
For information, no action requested
- 1.3 Report Back Item
- 1.4 Miscellaneous District Issues and Correspondence

2. Assistant General Manager's Report

- 2.1 Sacramento County Proposed Paving Requirements for Utilities
Status of Board of Supervisor's consideration
For information, no action requested
- 2.2 Report Back Items
- 2.3 Miscellaneous District Issues and Correspondence

3. Director of Finance's Report

- 3.1 Report Back Items
- 3.2 Miscellaneous District Issues and Correspondence

4. Legal Counsel's Report

- 4.1 Legal Matters

5. Directors' Reports

- 5.1 SGA
- 5.2 RWA
- 5.3 ACWA
 - 5.3.1 Local/Federal Government/Region 4 - Pam Tobin
 - 5.3.2 JPIA - Bob Walters
 - 5.3.3 Energy Committee - Ted Costa
- 5.4 CVP Water Users Association
- 5.5 Other Reports, Correspondence, and Comments
 - 5.5.1 Call to Action Updates

8:30 p.m.

VIII. UPCOMING EVENTS

- 1. ACWA Region 2&4 Event – SGMA: The View From Above
June 21, 2016
Sacramento, CA
- 2. RWA 15th Anniversary Luncheon
July 14, 2016
Sacramento, CA

President Tobin to call for Closed Session

IX. CLOSED SESSION

- 1. Conference with legal counsel--anticipated litigation; Government Code sections 54954.5(c) and 54956.9(b); significant exposure to litigation involving state and federal administrative proceedings and programs affecting District water rights

- X. OPEN SESSION**
Report from Closed Session

- XI. ADJOURN**

UPCOMING MEETING DATES

June 2, 2016 Workshop
June 8, 2016
June 22, 2016

I declare under penalty of perjury that the foregoing agenda for the May 25, 2016 regular meeting of the Board of Directors of San Juan Water District was posted by May 20, 2016, on the outdoor bulletin boards at the District Office Building, 9935 Auburn Folsom Road, Granite Bay, California, and was freely accessible to the public.

Teri Grant, Board Secretary

STAFF REPORT

To: Board of Directors

From: Keith Durkin, Assistant General Manager

Date: May 25, 2016

Subject: 2015 Urban Water Management Plan Public Hearing

RECOMMENDED ACTION

Receive staff presentation regarding the draft 2015 Urban Water Management Plan and receive public input.

BACKGROUND

The Urban Water Management Planning Act requires urban water suppliers, every five years, to develop a comprehensive water supply management plan that includes current and projected water supplies, water demands, supply reliability, and water efficiency actions including demand management measures. Staff worked with a consultant to develop the Plan and with regional stakeholders (including wholesale customer agencies).

The Plan became available for public review on April 22nd. A hard copy of the final draft is available in the Administrative office and an electronic copy is available on the District's website. Notification was provided to all interested parties that the Plan is available for review. Public hearing information has been posted twice in the Sacramento Bee announcing the hearing and all testimony will be taken into consideration at the May 25th Board Meeting.

CURRENT STATUS

After the public hearing is closed, all comments will be considered. Any amendments to the plan will be incorporated and a final Plan will be presented to the Board at the June 8th Board meeting for adoption.

AGENDA ITEM II-1

SAN JUAN WATER DISTRICT

Board of Director's Meeting Minutes
May 25, 2016 – 7:00 p.m.

BOARD OF DIRECTORS

Pam Tobin	President
Ken Miller	Vice President
Ted Costa	Director
Dan Rich	Director
Bob Walters	Director

SAN JUAN WATER DISTRICT MANAGEMENT AND STAFF

Shauna Lorange	General Manager
Keith Durkin	Assistant General Manager
Donna Silva	Director of Finance
Teri Grant	Board Secretary/Administrative Assistant
Jennifer Buckman	Legal Counsel

OTHER ATTENDEES

Poster Contest Winners and Family Members	
Lisa Brown	SJWD
Rose Strohmaier	SJWD
Kristi More	The Ferguson Group

AGENDA ITEMS

- I. **Presentation**
- II. **Public Hearing**
- III. **Public Forum**
- IV. **Consent Calendar**
- V. **Old Business**
- VI. **Committee Reports**
- VII. **Information and Action Items**
- VIII. **Upcoming Events**
- IX. **Closed Session**
- X. **Open Session**
- XI. **Adjourn**

President Tobin called the meeting to order at 7:00 p.m.

I. PRESENTATION

1. Poster Contest Winners – President Pam Tobin

President Tobin presented the Poster Contest awards to student winners in attendance, Angelica Christe, Tiana Uding and Tyler Lawrence. The Poster Contest winners for SJWD are as follows:

1st Place - Tiana Uding – Ms. Whitlow's 5th grade class

- 2nd Place - Tyler Lawrence – Mrs. Ashby’s 6th grade class
- 3rd Place - Angelica Christe – Ms. Noble’s 6th grade class

President Tobin awarded the Grand Prize award for the overall region winner to:

Tyler Lawrence - Mrs. Ashby’s 6th grade class

II. PUBLIC HEARING

1. 2015 Urban Water Management Plan

President Tobin opened the Public Hearing at 7:08 p.m.

Ms. Lorance confirmed that the Public Hearing was duly posted and published and that there were no formal written comments received.

Ms. Brown conducted a brief presentation on the Urban Water Management Plan (UWMP) and a copy of the presentation will be attached to the meeting minutes. Ms. Brown informed the Board that the UWMP Act requires suppliers to describe & evaluate the sources of water supply, efficient uses of water, and supply reliability. She explained that the District coordinated data sharing/plan review between wholesale customer agencies with the intent to provide consistent water demand, supply and reliability data for the region.

Ms. Brown informed the Board that the plan assumes surface water not used by retail and/or wholesale customer agencies will be used in the conjunctive use program. In addition, in 2010 the District was given four methods to choose from in order to comply with the Governor’s 20% by 2020 requirements. The District made the choice for a 20% reduction based on a ten-year baseline of 516 gallons per capita per day (GPCD). She informed the Board that the District was well under the 2015 interim target of 464 GPCD at 293 GPCD.

Ms. Brown informed the Board that the 2015 UWMP concludes that the water supplies available to the District’s retail and wholesale customer agencies are adequate over the next 25-year planning period, and the plan meets SBX7-7 requirements making the District eligible for State water grants & loans.

Ms. Brown informed the Board that adoption of the final UWMP will be considered at the June 8th Board meeting, in order to allow for comments. She explained that the plan will be submitted to DWR prior to the July 1, 2016 deadline and copies of the plan will be sent to the wholesale customer agencies and other interested parties.

President Tobin closed the Public Hearing at 7:21 p.m.

III. PUBLIC FORUM

There were no public comments.

IV. CONSENT CALENDAR

All items under the consent calendar are considered to be routine and are approved by one motion. There will be no separate discussion of these items unless a member of the Board, audience, or staff request a specific item removed after the motion to approve the Consent Calendar.

1. Minutes of the Board of Directors Minutes, May 11, 2016

Recommendation: Approve draft minutes

2. 2016 Proposed CSDA Bylaws Amendments

Recommendation: Affirmative vote on proposed bylaws amendments

Director Walters moved to approve the Consent Calendar. Director Costa seconded the motion and it carried unanimously.

V. OLD BUSINESS

1. Board Meeting Time Change

President Tobin reminded the Board that changing the time of the Board meetings was discussed at the last Board meeting. Ms. Lorance informed Board that the time was left blank on the resolution since the discussion was either 6:00 or 6:30 pm. The Board discussed the time to start the meeting and agreed that 6:00 pm was the best time.

Director Walters moved to adopt Resolution 16-08 to change the time of the Board of Directors meetings to 6:00 pm. Director Rich seconded the motion and it carried unanimously.

Ms. Lorance reminded the Board that the next Finance Committee meeting is on Tuesday, June 7th not June 14th.

ACTION AND INFORMATIONAL ITEMS

VI. COMMITTEE REPORTS

1. Legal Affairs Committee (5/17/16)

Director Walters reported that the committee met on May 17, 2016, and discussed the following:

- FO-40 Agreement on Payment Schedule (W)
- Groundwater Reimbursement Payment Schedule Agreement (W)
- Water Rate Restructuring Legal Constraints (W & R)
- Ordinance Review (W & R)
- Other Legal Affairs Matters
- Public Comment

The committee meeting minutes will be attached to the original board minutes.

FO-40 Agreement on Payment Schedule (W)

Director Walters reported that the committee discussed the agreement and the revised agreement that Fair Oaks Water District (FOWD) submitted regarding the second phase of the Fair Oaks-40 (FO-40) Pipeline Rehabilitation Project. He stated that the committee discussed the changes that were proposed by FOWD including their concern with paying in advance as they would be paying based on estimates not actual costs.

Director Walters informed the Board that it was suggested that the payment agreement be based on the schedule for receiving design and construction bids so that the payments are not based on estimates, but would be due prior to the District paying for design and construction. The final payment would true up all actual costs. He explained that staff will work with Legal Counsel to draft the revised payment agreement and forward to the committee and the WCAs in advance of the next meeting which is June 1st.

Director Costa commented that the committee expects this item to be finalized by the June 22nd Board meeting, which allows enough time for the Legal Affairs Committee to meet again and for the FOWD Board to review and discuss. Ms. Lorance commented that the capital facilities fees will continue to be billed until the agreement is signed.

For information only; no action requested

Groundwater Reimbursement Discussions (W)

Ms. Lorance reported that the Board agreed to the general concept to pay for the groundwater reimbursement charges. She explained that the financial plan will govern the payment schedule. She commented that the workshop to review the financial plans will be scheduled in late June. In the meantime, the WCAs are reviewing the groundwater reimbursement agreement which was revised. She explained that once the financial plan is completed then the payment information will be added to the agreement and the agreement will be finalized.

For information only; no action requested

Water Rate Restructuring Legal Constraints (W & R)

Ms. Lorance informed the Board that the continued requirement to reduce water use will continue to cause rate impacts. She commented that, with the anticipation of long-term water conservation, the Board should start considering changing the rate structure to cover more of the fixed costs in the fixed portion of the rates. Ms. Lorance commented that she has discussed this with Bob Reed, who is updating the District's financial plans.

For information only; no action requested

Ordinance Review (W &R)

For *Ordinance Review*, please refer to the committee meeting minutes.

Other Legal Affairs Matters (W/R)

Director Costa informed the Board that he had requested that the Board discuss adding a measure to the November ballot which addresses requiring a vote of the people when water rights are sold. He commented that he would like the Board to discuss this for the next election. Ms. Lorange commented that this would be a good topic for the long-term planning at the strategic workshop.

Director Walters reported that Mr. Durkin discussed Sacramento County's proposed paving requirements for utilities. Mr. Durkin commented that he will cover this topic under his Assistant General Manager's Report.

Director Walters reported that the next meeting was scheduled for June 1, 2016, at 4:00 pm.

VII. INFORMATION AND ACTION ITEMS

1. GENERAL MANAGER'S REPORT

1.1 State Water Resources Control Board Conservation Requirements

Ms. Lorange reported that the State Water Resources Control Board (SWRCB) held a meeting on May 18th to discuss how to comply with the recent Governor's Drought Executive Order. Ms. Lorange recently sent an email to the Board regarding a letter sent to the SWRCB pertaining to self-certification. She explained that demands are based on 2013-14 data and supplies are based on hydrology from 2013, 2014 and 2015. She informed the Board that based on these criteria the District has adequate water supplies should the next three years mirror the 2013-15 hydrology.

Ms. Lorange stated that she strongly recommends that the Board retain the existing conservation stage (Stage 2) and the 10% voluntary water reduction, in order to recognize the drought conditions in other areas of the state. She reviewed the Stage 2 and Stage 1 conservation differences, which the main difference is the 5-10% voluntary reduction in Stage 2.

Ms. Lorange read a portion of the Governor's Executive Order pertaining to long-term conservation. She commented that she interprets this to mean that water budgets will most likely be required in the future. She informed the Board that the proposed draft framework for agencies to follow is due in January 2017. Mr. Durkin mentioned that the SWRCB will most likely have to develop legislation in order to give authority for implementing this.

Ms. Lorange informed the Board that the Department of Water Resources (DWR) and SWRCB shall permanently require urban water suppliers to issue

a monthly report on their water usage, amount of conservation achieved, and any enforcement efforts.

For information, no action requested

1.2 Update on US Bureau of Reclamation Operations

Ms. Lorance informed the Board that National Marine Fisheries is requiring cold water be kept in Shasta, and that colder temperatures be delivered 10 miles further downstream in the Sacramento River than last year. At the same time, Fish and Wildlife Services, in an attempt to not lose the Delta Smelt this year, wants summer outflows increased to keep X2 at the 74 km point, and never past the 80 km point in order to keep X2 in the location of the best habitat. She commented that in order to accomplish this there is concern about the potential effect at Folsom. This topic will be discussed in Closed Session.

For information, no action requested

1.3 Report Back Item

There were no items discussed.

1.4 Miscellaneous District Issues and Correspondence

Ms. Lorance informed the Board that the Coordinated Operation Agreement (COA) is the agreement on how to operate the reservoirs between the CVP and SWP. She explained that CVP is responsible for 75% of in basin uses and SWP is 25%. The CVP is looking to review the assumptions used in development of the agreement. She informed the Board that she has been asked to sit on initial negotiation team as a representative of American River Contractors.

In response to Director Miller's question, Ms. Lorance explained that it is important to be represented in the discussions regarding Folsom so that any issues regarding the District's water supply can be addressed. Ms. More commented that it is important to get the sharing percentages between the state and federal projects in better balance so that the impact on Folsom is lessened.

Director Rich inquired about the extra funding for conservation that was discussed previously by the Board. Ms. Lorance explained that the funding was not needed this fiscal year due to the reduction in the conservation stage. Ms. Silva commented that the budget for FY 2016-17 will be based on the assumption of a 20% reduction from 2013 data.

Ms. Lorance informed the Board that the Mulch Mayhem event was held at the District on May 14th and was a great success. She commented that 100 yards of mulch were distributed in under three hours. President Tobin commented that she has mulch available if anyone wants to contact her.

Ms. Brown commented that the event was a great opportunity to thank our customers for their efforts to conserve water during the drought.

2. ASSISTANT GENERAL MANAGER'S REPORT

2.1 Sacramento County Proposed Paving Requirements for Utilities

Mr. Durkin informed the Board that Sacramento County is facing a huge budget shortfall related to paving maintenance. Their annual budget allows for \$8.4 million for paving maintenance; however, their paving needs range from \$32-36 million per year. Therefore, Sacramento County is considering changing their requirements for paving restoration after utility trenching is completed.

Mr. Durkin reported that Sacramento County is requesting that the Board of Supervisors adopt an ordinance change that would greatly increase the paving restoration requirements that are imposed on utilities due to trenching in the streets. He provided the Board with a written staff report that will be attached to the meeting minutes.

Mr. Durkin explained that the District was unaware of this proposed change which was on the County Board of Supervisors May 10th meeting agenda, but carried over to May 24th. He and Director Walters attended a community coffee meeting on May 18th held by Susan Peters, Board of Supervisor representative for District 3, and used the opportunity to discuss this issue and request that the item be tabled for at least 90 days. Roberta MacGlashan, Board of Supervisor representative for District 4, was contacted as well. At the May 24th Board of Supervisors meeting, the topic was carried over to August 9th.

Mr. Durkin stated that a joint meeting was held yesterday at SSWD with other local water utilities, SMUD, PG&E, and the Sacramento County Sewer District. The meeting was held to discuss a strategy to work with the County Department of Transportation (SacDOT) regarding reasonable options for trench reconstruction. A meeting has been scheduled for June 9th with Michael Pinrose, SacDOT, to discuss this issue.

Mr. Durkin requested that the Directors reach out to Supervisors Peters and MacGlashan, as well as any of the other supervisors and staff, to discuss this issue. Mr. Durkin will send a bulleted list of talking points to the Board. Director Miller commented that reaching out to staff, as they are the ones submitting the request to the Board of Supervisors, might not be of any benefit.

Director Costa commented that one of the taxes on gas should be going to cover road maintenance; however, he suspects that not all the funds end up for road maintenance. He commented that customers pay water fees for water not to fix the roads, and their rates should not be raised to pay for what

they are already paying for under gas taxes. Ms. Buckman commented that the proposed requirements will be disproportional to the impact caused by the utility project.

For information, no action requested

2.2 Report Back Items

There were no items discussed.

2.3 Miscellaneous District Issues and Correspondence

Mr. Durkin reported that he attended the last Army Corp of Engineers workshop for the Folsom Dam Water Control Manual Update. He informed the Board that the tentatively selected plan will incorporate forecast-based operations that include upstream storage, basin wetness factor, and weather forecasting via the National Weather Service. The modeling indicates that approximately 30,000 acre feet of additional water would remain in storage in Folsom in dry years. He commented that, if Folsom had been operated this year using the tentatively selected plan, an extra 50,000-75,000 acre feet of water would have been available for storage.

Mr. Durkin reported that the Army Corp of Engineers will complete the NEPA/CEQA process by August with a public review in August/September. It is expected that the Water Control Manual will be completed by April 2017, which should coincide with completion of the Joint Federal Project (spillway). Mr. Durkin informed the Board that he considers this a success story, since the District was able to be involved in the process and push for forecast-based operations. Ms. Lorange commented that, once this is completed, a press release should be considered.

Mr. Durkin informed the Board that Citrus Heights Water District (CHWD) directors and staff will take a tour of the WTP on May 30th. In addition, ACWA President Cathy Tiegs and ACWA staff will tour the WTP on May 25th.

Mr. Durkin informed the Board that he will be making a presentation to the CHWD Board on June 14th to provide an update on significant issues that might affect the District in the future.

3. DIRECTOR OF FINANCE'S REPORT

3.1 Report Back Items

Ms. Silva reported that she expects to receive the draft financials next week. She explained that once the financials are received then staff will finalize the management section. She scheduled the auditors to make their presentation to the Board at the June 22nd meeting. In addition, the auditors will also present their final report regarding the accounting system conversion.

Ms. Silva reported that the FY 2016-17 budget is underway and she has met with all of the departments to discuss their budget information. Ms. Lorance commented that the budget will be reviewed at the finance workshop at the end of June.

3.2 Miscellaneous District Issues and Correspondence

Ms. Silva reported that the Workers' Compensation rates for next year are going down 10%. She commented that JPIA provides excellent safety training programs that District employees have participated in which helped reduce the District's rates.

4. LEGAL COUNSEL'S REPORT

4.1 Legal Matters

Ms. Buckman commented that items will be covered in Closed Session.

In response to Director Costa's comment, Ms. Buckman informed the Board that HJTA has already filed three cases related to water rates, but not related to roads. She commented that the county should have mitigation fee act studies to support the amount of fees imposed on developers.

5. DIRECTORS' REPORTS

5.1 SGA

President Tobin reported that SGA meets June 9, 2016.

5.2 RWA

President Tobin reported that RWA met May 12, 2016.

5.3 ACWA

5.3.1 Local/Federal Government/Region 4 - Pam Tobin

No report.

5.3.2 JPIA - Bob Walters

Director Walters reported that JPIA met on May 2nd. He reported that another district was about to be terminated under JPIA coverage; however, that district conducted a presentation to the JPIA Board and the decision to terminate coverage was postponed until the ACWA Fall Conference. He commented that the JPIA Executive Director stated that if JPIA was a private company then they would be one of the largest insurance companies.

5.3.3 Energy Committee - Ted Costa

No report.

5.4 CVP Water Users Association

No report.

5.5 Other Reports and Comments

5.5.1 Call to Action

President Tobin inquired how the Board member extra projects were going. Director Miller reported that he attended the RWA Lobbyist Program meeting where they discussed the bills that could impact the District.

5.5.2 Other

President Tobin mentioned that ACWA Regions 2 & 4 are having an event on June 21st titled, "SGMA: The View From Above. She requested that the Board Secretary sign her up for the event.

Director Walters requested that the Directors save the date for a meeting between SJWD and FOWD on September 19th at FOWD. The other WCAs will also be invited. A time has not been set yet and the meeting purpose is to summarize the 2x2 meetings that Director Rich and Director Walters have been attending with two of the FOWD Board members.

President Tobin mentioned that RWA is holding their 15th Anniversary Luncheon on July 14th. Ms. Lorange confirmed that a table has been reserved for SJWD and requested that the Directors inform her if they are attending.

VIII. UPCOMING EVENTS

1. ACWA Region 2&4 Event – SGMA: The View From Above
June 21, 2016
Sacramento, CA
2. RWA 15th Anniversary Luncheon
July 14, 2016
Sacramento, CA

President Tobin called for Closed Session at 8:45 pm.

IX. CLOSED SESSION

1. Conference with legal counsel--anticipated litigation; Government Code sections 54954.5(c) and 54956.9(b); significant exposure to litigation involving state and federal administrative proceedings and programs affecting District water rights

President Tobin returned to Open Session at 9:28 pm.

X. OPEN SESSION

There was no reported action during closed session.

XI. ADJOURN

The meeting was adjourned at 9:28 p.m.



PAMELA TOBIN, President
Board of Directors
San Juan Water District

ATTEST:



TERI GRANT, Board Secretary

Appendix D

AWWA Water Audits

AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targeting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:

Email Address:

Telephone (incl Ext.):

Name of City / Utility:

City/Town/Municipality:

State / Province:

Country:

Year:

Start Date: Enter MM/YYYY numeric format

End Date: Enter MM/YYYY numeric format

Audit Preparation Date:

Volume Reporting Units:

PWSID / Other ID:

The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: Value:


Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

<p><u>Instructions</u></p> <p>The current sheet. Enter contact information and basic audit details (year, units etc)</p>	<p><u>Reporting Worksheet</u></p> <p>Enter the required data on this worksheet to calculate the water balance and data grading</p>	<p><u>Comments</u></p> <p>Enter comments to explain how values were calculated or to document data sources</p>	<p><u>Performance Indicators</u></p> <p>Review the performance indicators to evaluate the results of the audit</p>	<p><u>Water Balance</u></p> <p>The values entered in the Reporting Worksheet are used to populate the Water Balance</p>	<p><u>Dashboard</u></p> <p>A graphical summary of the water balance and Non-Revenue Water components</p>
<p><u>Grading Matrix</u></p> <p>Presents the possible grading options for each input component of the audit</p>	<p><u>Service Connection Diagram</u></p> <p>Diagrams depicting possible customer service connection line configurations</p>	<p><u>Definitions</u></p> <p>Use this sheet to understand the terms used in the audit process</p>	<p><u>Loss Control Planning</u></p> <p>Use this sheet to interpret the results of the audit validity score and performance indicators</p>	<p><u>Example Audits</u></p> <p>Reporting Worksheet and Performance Indicators examples are shown for two validated audits</p>	<p><u>Acknowledgements</u></p> <p>Acknowledgements for the AWWA Free Water Audit Software v5.0</p>

If you have questions or comments regarding the software please contact us via email at: wic@awwa.org



AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition

+ Click to add a comment

Water Audit Report for: San Juan Water District

Reporting Year: 2014 1/2014 - 12/2014

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

WATER SUPPLIED

----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+	?	8	35,037.340	acre-ft/yr
Water imported:	+	?	n/a		acre-ft/yr
Water exported:	+	?	n/a		acre-ft/yr

WATER SUPPLIED: 35,037.340 acre-ft/yr

AUTHORIZED CONSUMPTION

Billed metered:	+	?	6	33,719.970	acre-ft/yr
Billed unmetered:	+	?	10	0.000	acre-ft/yr
Unbilled metered:	+	?	8	529.510	acre-ft/yr
Unbilled unmetered:	+	?	8	88.000	acre-ft/yr

AUTHORIZED CONSUMPTION: 34,337.480 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

699.860 acre-ft/yr

Apparent Losses

Unauthorized consumption:	+	?	9	50.000	acre-ft/yr
Customer metering inaccuracies:	+	?	6	350.370	acre-ft/yr
Systematic data handling errors:	+	?	7	100.000	acre-ft/yr

Apparent Losses: 500.370 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 199.490 acre-ft/yr

WATER LOSSES: 699.860 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 1,317.370 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

Master Meter and Supply Error Adjustments

Pcnt: 0 Value: 88.000 acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

Click here: ?
for help using option buttons below

Pcnt: 0 Value: 50.000 acre-ft/yr

Use buttons to select percentage of water supplied OR value

Pcnt: 0 Value: 350.370 acre-ft/yr

Pcnt: 0 Value: 100.000 acre-ft/yr

SYSTEM DATA

Length of mains:	+	?	10	15.6	miles
Number of <u>active AND inactive</u> service connections:	+	?	10		
Service connection density:	+	?	?	1	conn./mile main

Are customer meters typically located at the curbstops or property line? Yes (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line: ? **Average length of customer service line has been set to zero and a data grading score of 10 has been applied**

Average operating pressure: 9 50.0 psi

COST DATA

Total annual cost of operating water system:	+	?	10	\$5,683.641	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	10	\$0.47	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+	?	10	\$162.22	\$/acre-ft

Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 82 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Volume from own sources
- 2: Billed metered
- 3: Customer metering inaccuracies

AWWA Free Water Audit Software v5.0

Reporting Worksheet 1



AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.

Water Audit Report for: San Juan Water District
 Reporting Year: 2014 | 1/2014 - 12/2014

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 82 out of 100 ***

System Attributes:

	Apparent Losses:	500.370	acre-ft/yr
+	Real Losses:	199.490	acre-ft/yr
=	<u>Water Losses:</u>	<u>699.860</u>	acre-ft/yr

? Unavoidable Annual Real Losses (UARL): See limits in definition acre-ft/yr

Annual cost of Apparent Losses: \$102,442

Annual cost of Real Losses: \$32,361 Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial: { Non-revenue water as percent by volume of Water Supplied: 3.8%
 Non-revenue water as percent by cost of operating system: 4.1% Real Losses valued at Variable Production Cost

Operational Efficiency: { Apparent Losses per service connection per day: 49633.51 gallons/connection/day
 Real Losses per service connection per day: N/A gallons/connection/day
 Real Losses per length of main per day*: 11,416.23 gallons/mile/day
 Real Losses per service connection per day per psi pressure: N/A gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): 199.49 acre-feet/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]:

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

General Comment:	
-------------------------	--

Audit Item	Comment
Volume from own sources:	
Vol. from own sources: Master meter error adjustment:	
Water imported:	
Water imported: master meter error adjustment:	
Water exported:	
Water exported: master meter error adjustment:	
Billed metered:	
Billed unmetered:	
Unbilled metered:	
Unbilled unmetered:	
Unauthorized consumption:	
Customer metering inaccuracies:	
Systematic data handling errors:	
Length of mains:	
Number of active AND inactive service connections:	
Average length of customer service line:	
Average operating pressure:	
Total annual cost of operating water system:	
Customer retail unit cost (applied to Apparent Losses):	
Variable production cost (applied to Real Losses):	



AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	San Juan Water District	
Reporting Year:	2014	1/2014 - 12/2014
Data Validity Score:	82	

	Water Exported	Billed Water Exported			
	<i>0.000</i>		Billed Authorized Consumption	Billed Metered Consumption (water exported is removed)	Revenue Water
Own Sources (Adjusted for known errors) 35,037.340	Water Supplied 35,037.340	Authorized Consumption 34,337.480	33,719.970	33,719.970	33,719.970
			Unbilled Authorized Consumption 617.510	Billed Unmetered Consumption 0.000	Non-Revenue Water (NRW) 1,317.370
Water Imported 0.000	Water Losses 699.860	Apparent Losses 500.370	Unbilled Metered Consumption 529.510	Unbilled Unmetered Consumption 88.000	1,317.370
			Unauthorized Consumption 50.000	Customer Metering Inaccuracies 350.370	
			Systematic Data Handling Errors 100.000	Leakage on Transmission and/or Distribution Mains Not broken down	
			Real Losses 199.490	Leakage and Overflows at Utility's Storage Tanks Not broken down	
			Leakage on Service Connections Not broken down		



AWWA Free Water Audit Software: Dashboard

WAS v5.0

American Water Works Association.

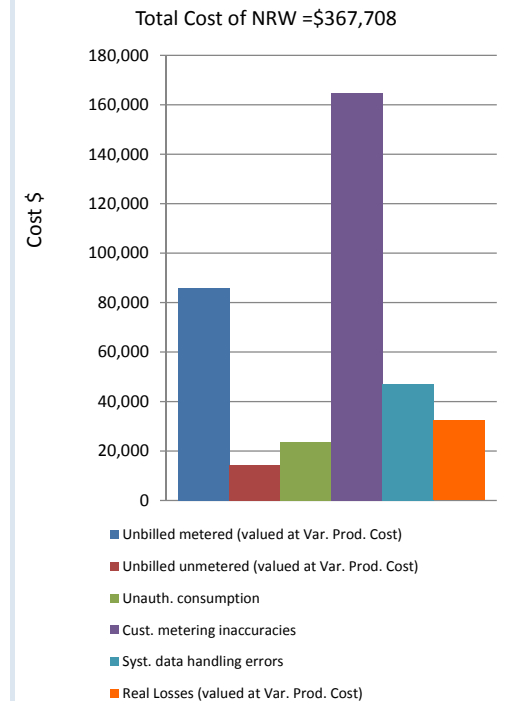
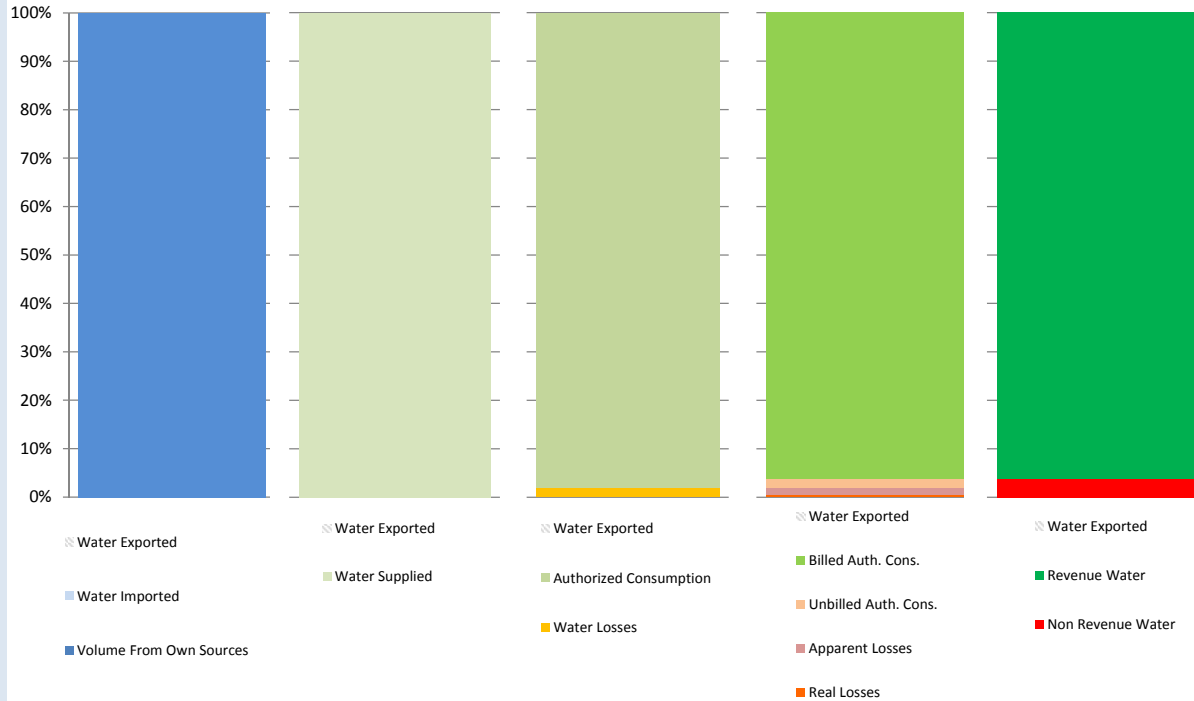
The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

Water Audit Report for: **San Juan Water District**

Reporting Year: **2014** **1/2014 - 12/2014**

Data Validity Score: **82**

- Show me the VOLUME of Non-Revenue Water
- Show me the COST of Non-Revenue Water





AWWA Free Water Audit Software: Grading Matrix

WAS 5.0

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The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
WATER SUPPLIED											
Volume from own sources:	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered; remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered; other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		to qualify for 2: Organize and launch efforts to collect data for determining volume from own sources	to qualify for 4: Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		to qualify for 6: Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		to qualify for 8: Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system; tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimate of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected, and/or error is confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and source meters ensures minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	to qualify for 4: Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		to qualify for 6: Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		to qualify for 8: Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		to qualify for 10: Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
Water Imported:	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/ imported water)	Less than 25% of imported water sources are metered; remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered; other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Imported Volume" component: <i>(Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.)</i>		to qualify for 2: Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	To qualify for 4: Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered imported water interconnections and replace obsolete/defective meters.		to qualify for 6: Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		to qualify for 8: Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is un-metered, with Imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected, and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous imported supply metered flow data is logged automatically & reviewed each business day by the Importer. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		<i>to qualify for 2:</i> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	<i>to qualify for 4:</i> Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management, revise the terms as necessary.		<i>to qualify for 6:</i> Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		<i>to qualify for 8:</i> Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		<i>to qualify for 10:</i> Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility; at least every five years.		<i>to maintain 10:</i> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component: <i>(Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.)</i>		<i>to qualify for 2:</i> Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	<i>To qualify for 4:</i> Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmetered exported water interconnections and replace obsolete/defective meters		<i>to qualify for 6:</i> Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmetered exported water interconnections and replacement of obsolete/defective meters.		<i>to qualify for 8:</i> Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		<i>to qualify for 10:</i> Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<i>to maintain 10:</i> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis, with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.	to qualify for 4: Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.		to qualify for 6: Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		to qualify for 8: Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		to qualify for 10: Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities; at least every five years.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
AUTHORIZED CONSUMPTION											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted, with less than 50% meter read success rate, remaining accounts' consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with volume-based billing from meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records exist, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; or at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; or minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials underway. Statistically significant customer meter replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.	to qualify for 4: Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.		to qualify for 6: Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.		to qualify for 8: Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.		to qualify for 10: Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.		to maintain 10: Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter; i.e. no intentionally unmetered accounts exist	Water utility policy does <u>not</u> require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does <u>not</u> require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy <u>does</u> require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy <u>does</u> require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy <u>does</u> require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy <u>does</u> require metering and volume based billing for all customer accounts. However, less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		<u>to qualify for 2:</u> Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.	<u>to qualify for 4:</u> Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.		<u>to qualify for 6:</u> Refine policy and procedures to improve customer metering participation for all but solely exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significant reduce the number of unmetered accounts		<u>to qualify for 8:</u> Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.		<u>to qualify for 10:</u> Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.		<u>to maintain 10:</u> Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist; and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.	Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.	Conditions between 2 and 4	Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.	Conditions between 4 and 6	Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.	Conditions between 6 and 8	Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.	Conditions between 8 and 10	Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		<u>to qualify for 2:</u> Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.	<u>to qualify for 4:</u> Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.		<u>to qualify for 6:</u> Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.		<u>to qualify for 8:</u> Communicate billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.		<u>to qualify for 10:</u> Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.		<u>to maintain 10:</u> Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.
Unbilled unmetered:		Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.	Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.	Conditions between 2 and 4	Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).	Default value of 1.25% of system input volume is employed	Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.	Conditions between 6 and 8	Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events or temporary meters, and relatively subjective estimates of less regulated use.	Conditions between 8 and 10	Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		<u>to qualify for 5:</u> Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. <u>to qualify for 2:</u> Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushing).	<u>to qualify for 5:</u> Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. <u>to qualify for 4:</u> Evaluate the documentation of events that have been observed. Meet with user groups (ex: for fire hydrants- fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).		<u>to qualify for 5:</u> Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, unmetered consumption is usually a relatively small quantity component, and other larger-quantity components should take priority.	<u>to qualify for 6 or 8:</u> Finalize policy and begin to conduct field checks to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.	<u>to qualify for 8:</u> Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.		<u>to qualify for 10:</u> Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.		<u>to maintain 10:</u> Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.
APPARENT LOSSES											

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	Conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters); but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		<u>to qualify for 5:</u> Use accepted default of 0.25% of volume of water supplied. <u>to qualify for 2:</u> Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	<u>to qualify for 5:</u> Use accepted default of 0.25% of system input volume <u>to qualify for 4:</u> Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		<u>to qualify for 5:</u> Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	<u>to qualify for 6 or greater:</u> Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	<u>to qualify for 8:</u> Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		<u>to qualify for 10:</u> Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		<u>to maintain 10:</u> Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	<u>to qualify for 2:</u> Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	<u>to qualify for 4:</u> Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		<u>to qualify for 6:</u> Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		<u>to qualify for 8:</u> Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		<u>to qualify for 9:</u> Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	<u>to qualify for 10:</u> Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	<u>to maintain 10:</u> Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetered customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but need refinement. Computerized billing system exists, but is dated or lacks needed functionality. Periodic, limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal audits conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		<u>to qualify for 2:</u> Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	<u>to qualify for 4:</u> Finalize written policy and procedures for activation of new billing accounts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		<u>to qualify for 6:</u> Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Periodize internal annual audit process.		<u>to qualify for 8:</u> Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		<u>to qualify for 10:</u> Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		<u>to maintain 10:</u> Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
SYSTEM DATA											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in a uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographical Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		<u>to qualify for 2:</u> Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	<u>to qualify for 4:</u> Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		<u>to qualify for 6:</u> Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		<u>to qualify for 8:</u> Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		<u>to qualify for 10:</u> Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve the completeness and accuracy of the system.
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well-managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	Note: The number of Service Connections does not include fire hydrant leads/fire hydrant connecting the hydrant to the water main	<u>to qualify for 2:</u> Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	<u>to qualify for 4:</u> Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		<u>to qualify for 6:</u> Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		<u>to qualify for 8:</u> Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		<u>to qualify for 10:</u> Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve knowledge of system.
	Note: if customer water meters are located outside	Gradings 1-9 apply if customer properties are unmetered, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex: faucet) or the customer meter must be quantified. Gradings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									Either of two conditions can be met for a grading of 10:

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Average length of customer service line:	How are records located of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility; and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Worksheet asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet. b) Meters exist inside customer buildings, or properties are unmetered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		<u>to qualify for 2:</u> Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	<u>to qualify for 4:</u> Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		<u>to qualify for 6:</u> Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		<u>to qualify for 8:</u> Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		<u>to qualify for 10:</u> Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/rare pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system, occasional open boundary valves are discovered that breach pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breach pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar real-time monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones, SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.
Improvements to attain higher data grading for "Average Operating Pressure" component:		<u>to qualify for 2:</u> Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	<u>to qualify for 4:</u> Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		<u>to qualify for 6:</u> Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		<u>to qualify for 8:</u> Install a Supervisory Control and Data Acquisition (SCADA) System, or similar real-time monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		<u>to qualify for 10:</u> Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		<u>to maintain 10:</u> Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for real-time pressure data calibration, and averaging.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
COST DATA											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		<u>to qualify for 2:</u> Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		<u>to qualify for 8:</u> Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmetered, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented; resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined, allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		<u>to qualify for 2:</u> Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	<u>to qualify for 4:</u> Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		<u>to qualify for 6:</u> Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	<u>Launch effort to fully meter the customer population and charge rates based upon water volumes</u>	<u>to qualify for 8:</u> Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to qualify for 10:</u> Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to maintain 10:</u> Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: if the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet, with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis. or: 2) Water supply is entirely purchased as bulk imported water, and unit purchase cost serves as the variable production cost.
Improvements to attain higher data grading for "Variable Production Cost" component:		<u>to qualify for 2:</u> Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		<u>to qualify for 8:</u> Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.). Arrange to conduct audits by a knowledgeable third-party at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively



Average Length of Customer Service Line

The three figures shown on this worksheet display the assignment of the Average Length of Customer Service Line, L_p , for the three most common piping configurations.

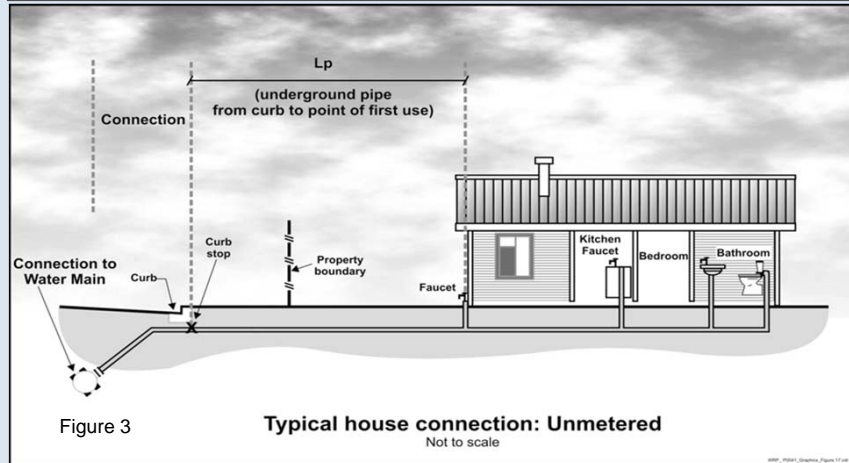
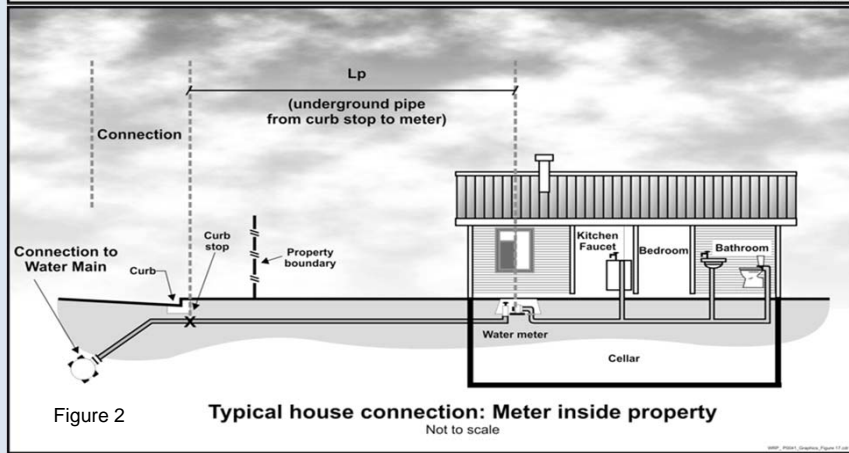
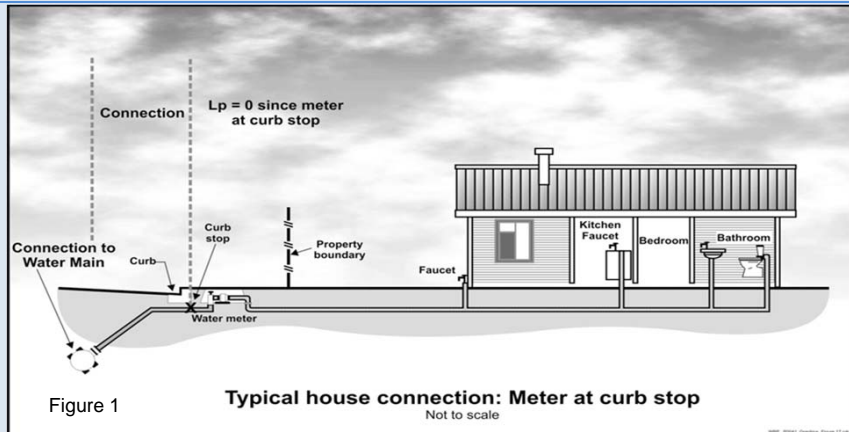
Figure 1 shows the configuration of the water meter outside of the customer building next to the curb stop valve. In this configuration $L_p = 0$ since the distance between the curb stop and the customer metering point is essentially zero.

Figure 2 shows the configuration of the customer water meter located inside the customer building, where L_p is the distance from the curb stop to the water meter.

Figure 3 shows the configuration of an unmetered customer building, where L_p is the distance from the curb stop to the first point of customer water consumption, or, more simply, the building line.

In any water system the L_p will vary notably in a community of different structures, therefore the average L_p value is used and this should be approximated or calculated if a sample of service line measurements has been gathered.

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Item Name	Description
<p>Apparent Losses</p> <p>Find</p>	<p>= unauthorized consumption + customer metering inaccuracies + systematic data handling errors</p> <p>Apparent Losses include all types of inaccuracies associated with customer metering (worn meters as well as improperly sized meters or wrong type of meter for the water usage profile) as well as systematic data handling errors (meter reading, billing, archiving and reporting), plus unauthorized consumption (theft or illegal use).</p> <p>NOTE: Over-estimation of Apparent Losses results in under-estimation of Real Losses. Under-estimation of Apparent Losses results in over-estimation of Real Losses.</p>
<p>AUTHORIZED CONSUMPTION</p> <p>Find</p>	<p>= billed water exported + billed metered + billed unmetered + unbilled metered + unbilled unmetered consumption</p> <p>The volume of metered and/or unmetered water taken by registered customers, the water utility's own uses, and uses of others who are implicitly or explicitly authorized to do so by the water utility; for residential, commercial, industrial and public-minded purposes.</p> <p>Typical retail customers' consumption is tabulated usually from established customer accounts as billed metered consumption, or - for unmetered customers - billed unmetered consumption. These types of consumption, along with billed water exported, provide revenue potential for the water utility. Be certain to tabulate the water exported volume as a separate component and do not "double-count" it by including in the billed metered consumption component as well as the water exported component.</p> <p>Unbilled authorized consumption occurs typically in non-account uses, including water for fire fighting and training, flushing of water mains and sewers, street cleaning, watering of municipal gardens, public fountains, or similar public-minded uses. Occasionally these uses may be metered and billed (or charged a flat fee), but usually they are unmetered and unbilled. In the latter case, the water auditor may use a default value to estimate this quantity, or implement procedures for the reliable quantification of these uses. This starts with documenting usage events as they occur and estimating the amount of water used in each event. (See Unbilled unmetered consumption)</p>
<p>View Service Connection Diagram</p> <p>Average length of customer service line</p> <p>Find</p>	<p>This is the average length of customer service line, Lp, that is owned and maintained by the customer; from the point of ownership transfer to the customer water meter, or building line (if unmetered). The quantity is one of the data inputs for the calculation of Unavoidable Annual Real Losses (UARL), which serves as the denominator of the performance indicator: Infrastructure Leakage Index (ILI). The value of Lp is multiplied by the number of customer service connections to obtain a total length of customer owned piping in the system. The purpose of this parameter is to account for the unmetered service line infrastructure that is the responsibility of the customer for arranging repairs of leaks that occur on their lines. In many cases leak repairs arranged by customers take longer to be executed than leak repairs arranged by the water utility on utility-maintained piping. Leaks run longer - and lose more water - on customer-owned service piping, than utility owned piping.</p> <p>If the customer water meter exists near the ownership transfer point (usually the curb stop located between the water main and the customer premises) this distance is zero because the meter and transfer point are the same. This is the often encountered configuration of customer water meters located in an underground meter box or "pit" outside of the customer's building. The Free Water Audit Software asks a "Yes/No" question about the meter at this location. If the auditor selects "Yes" then this distance is set to zero and the data grading score for this component is set to 10.</p> <p>If water meters are typically located inside the customer premise/building, or properties are unmetered, it is up to the water auditor to estimate a system-wide average Lp length based upon the various customer land parcel sizes and building locations in the service area. Lp will be a shorter length in areas of high density housing, and a longer length in areas of low density housing and varied commercial and industrial buildings. General parcel demographics should be employed to obtain a composite average Lp length for the entire system.</p> <p>Refer to the "Service Connection Diagram" worksheet for a depiction of the service line/metering configurations that typically exist in water utilities. This worksheet gives guidance on the determination of the Average Length, Lp, for each configuration.</p>
<p>Average operating pressure</p> <p>Find</p>	<p>This is the average pressure in the distribution system that is the subject of the water audit. Many water utilities have a calibrated hydraulic model of their water distribution system. For these utilities, the hydraulic model can be utilized to obtain a very accurate quantity of average pressure. In the absence of a hydraulic model, the average pressure may be approximated by obtaining readings of static water pressure from a representative sample of fire hydrants or other system access points evenly located across the system. A weighted average of the pressure can be assembled; but be sure to take into account the elevation of the fire hydrants, which typically exist several feet higher than the level of buried water pipelines. If the water utility is compiling the water audit for the first time, the average pressure can be approximated, but with a low data grading. In subsequent years of auditing, effort should be made to improve the accuracy of the average pressure quantity. This will then qualify the value for a higher data grading.</p>
<p>Billed Authorized Consumption</p>	<p>All consumption that is billed and authorized by the utility. This may include both metered and unmetered consumption. See "Authorized Consumption" for more information.</p>
<p>Billed metered consumption</p> <p>Find</p>	<p>All metered consumption which is billed to retail customers, including all groups of customers such as domestic, commercial, industrial or institutional. It does NOT include water supplied to neighboring utilities (water exported) which is metered and billed. Be sure to subtract any consumption for exported water sales that may be included in these billing roles. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component. The metered consumption data can be taken directly from billing records for the water audit period. The accuracy of yearly metered consumption data can be refined by including an adjustment to account for customer meter reading lag time since not all customer meters are read on the same day of the meter reading period. However additional analysis is necessary to determine the lag time adjustment value, which may or may not be significant.</p>
<p>Billed unmetered consumption</p> <p>Find</p>	<p>All billed consumption which is calculated based on estimates or norms from water usage sites that have been determined by utility policy to be left unmetered. This is typically a very small component in systems that maintain a policy to meter their customer population. However, this quantity can be the key consumption component in utilities that have not adopted a universal metering policy. This component should NOT include any water that is supplied to neighboring utilities (water exported) which is unmetered but billed. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component.</p>
<p>Customer metering inaccuracies</p> <p>Find</p>	<p>Apparent water losses caused by the collective under-registration of customer water meters. Many customer water meters gradually wear as large cumulative volumes of water are passed through them over time. This causes the meters to under-register the flow of water. This occurrence is common with smaller residential meters of sizes 5/8-inch and 3/4 inch after they have registered very large cumulative volumes of water, which generally occurs only after periods of years. For meters sized 1-inch and larger - typical of multi-unit residential, commercial and industrial accounts - meter under-registration can occur from wear or from the improper application of the meter; i.e. installing the wrong type of meter or the wrong size of meter, for the flow pattern (profile) of the consumer. For instance, many larger meters have reduced accuracy at low flows. If an oversized meter is installed, most of the time the routine flow will occur in the low flow range of the meter, and a significant portion of it may not be registered. It is important to properly select and install all meters, but particularly large customer meters, size 1-inch and larger.</p> <p>The auditor has two options for entering data for this component of the audit. The auditor can enter a percentage under-registration (typically an estimated value), this will apply the selected percentage to the two categories of metered consumption to determine the volume of water not recorded due to customer meter inaccuracy. Note that this percentage is a composite average inaccuracy for all customer meters in the entire meter population. The percentage will be multiplied by the sum of the volumes in the Billed Metered and Unbilled Metered components. Alternatively, if the auditor has substantial data from meter testing activities, he or she can calculate their own loss volumes, and this volume may be entered directly.</p> <p>Note that a value of zero will be accepted but an alert will appear asking if the customer population is unmetered. Since all metered systems have some degree of inaccuracy, a positive value should be entered. A value of zero in this component is valid only if the water utility does not meter its customer population.</p>

Item Name	Description
<p>Customer retail unit cost</p> <p>Find</p>	<p>The Customer Retail Unit Cost represents the charge that customers pay for water service. This unit cost is applied routinely to the components of Apparent Loss, since these losses represent water reaching customers but not (fully) paid for. Since most water utilities have a rate structure that includes a variety of different costs based upon class of customer, a weighted average of individual costs and number of customer accounts in each class can be calculated to determine a single composite cost that should be entered into this cell. Finally, the weighted average cost should also include additional charges for sewer, storm water or biosolids processing, <u>but only if</u> these charges are based upon the volume of potable water consumed.</p> <p>For water utilities in regions with limited water resources and a questionable ability to meet the drinking water demands in the future, the Customer Retail Unit Cost might also be applied to value the Real Losses; instead of applying the Variable Production Cost to Real Losses. In this way, it is assumed that every unit volume of leakage reduced by leakage management activities will be sold to a customer.</p> <p>Note: the Free Water Audit Software allows the user to select the units that are charged to customers (either \$/1,000 gallons, \$/hundred cubic feet, or \$/1,000 litres) and automatically converts these units to the units that appear in the "WATER SUPPLIED" box. The monetary units are United States dollars, \$.</p>
<p>Infrastructure Leakage Index (ILI)</p> <p>Find</p>	<p>The ratio of the Current Annual Real Losses (Real Losses) to the Unavoidable Annual Real Losses (UARL). The ILI is a highly effective performance indicator for comparing (benchmarking) the performance of utilities in operational management of real losses.</p>
<p>Length of mains</p> <p>Find</p>	<p>Length of all pipelines (except service connections) in the system starting from the point of system input metering (for example at the outlet of the treatment plant). It is also recommended to include in this measure the total length of fire hydrant lead pipe. Hydrant lead pipe is the pipe branching from the water main to the fire hydrant. Fire hydrant leads are typically of a sufficiently large size that is more representative of a pipeline than a service connection. The average length of hydrant leads across the entire system can be assumed if not known, and multiplied by the number of fire hydrants in the system, which can also be assumed if not known. This value can then be added to the total pipeline length. Total length of mains can therefore be calculated as:</p> <p>Length of Mains, miles = (total pipeline length, miles) + [{(average fire hydrant lead length, ft) x (number of fire hydrants)} / 5,280 ft/mile]</p> <p style="text-align: center;">or</p> <p>Length of Mains, kilometres = (total pipeline length, kilometres) + [{(average fire hydrant lead length, metres) x (number of fire hydrants)} / 1,000 metres/kilometre]</p>
<p>NON-REVENUE WATER</p> <p>Find</p>	<p>= Apparent Losses + Real Losses + Unbilled Metered Consumption + Unbilled Unmetered Consumption. This is water which does not provide revenue potential to the utility.</p>
<p>Number of active AND inactive service connections</p> <p>Find</p>	<p>Number of customer service connections, extending from the water main to supply water to a customer. Please note that this includes the actual number of distinct piping connections, including fire connections, whether active or inactive. This may differ substantially from the number of customers (or number of accounts). Note: this number does not include the pipeline leads to fire hydrants - the total length of piping supplying fire hydrants should be included in the "Length of mains" parameter.</p>
<p>Real Losses</p> <p>Find</p>	<p>Physical water losses from the pressurized system (water mains and customer service connections) and the utility's storage tanks, up to the point of customer consumption. In metered systems this is the customer meter, in unmetered situations this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows.</p>
<p>Revenue Water</p>	<p>Those components of System Input Volume that are billed and have the potential to produce revenue.</p>
<p>Service Connection Density</p> <p>Find</p>	<p>=number of customer service connections / length of mains</p>
<p>Systematic data handling errors</p> <p>Find</p>	<p>Apparent losses caused by accounting omissions, errant computer programming, gaps in policy, procedure, and permitting/activation of new accounts; and any type of data lapse that results in under-stated customer water consumption in summary billing reports.</p> <p>Systematic Data Handling Errors result in a direct loss of revenue potential. Water utilities can find "lost" revenue by keying on this component.</p> <p>Utilities typically measure water consumption registered by water meters at customer premises. The meter should be read routinely (ex: monthly) and the data transferred to the Customer Billing System, which generates and sends a bill to the customer. Data Transfer Errors result in the consumption value being less than the actual consumption, creating an apparent loss. Such error might occur from illegible and mis-recorded hand-written readings compiled by meter readers, inputting an incorrect meter register unit conversion factor in the automatic meter reading equipment, or a variety of similar errors.</p> <p>Apparent losses also occur from Data Analysis Errors in the archival and data reporting processes of the Customer Billing System. Inaccurate estimates used for accounts that fail to produce a meter reading are a common source of error. Billing adjustments may award customers a rightful monetary credit, but do so by creating a negative value of consumption, thus under-stating the actual consumption. Account activation lapses may allow new buildings to use water for months without meter readings and billing. Poor permitting and construction inspection practices can result in a new building lacking a billing account, a water meter and meter reading; i.e., the customer is unknown to the utility's billing system.</p> <p>Close auditing of the permitting, metering, meter reading, billing and reporting processes of the water consumption data trail can uncover data management gaps that create volumes of systematic data handling error. Utilities should routinely analyze customer billing records to detect data anomalies and quantify these losses. For example, a billing account that registers zero consumption for two or more billing cycles should be checked to explain why usage has seemingly halted. Given the revenue loss impacts of these losses, water utilities are well-justified in providing continuous oversight and timely correction of data transfer errors & data handling errors.</p> <p>If the water auditor has not yet gathered detailed data or assessment of systematic data handling error, it is recommended that the auditor apply the default value of 0.25% of the Billed Authorized Consumption volume. However, if the auditor has investigated the billing system and its controls, and has well validated data that indicates the volume from systematic data handling error is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations and select an appropriate grading. Note: negative values are not allowed for this audit component. If the auditor enters zero for this component then a grading of 1 will be automatically assigned.</p>
<p>Total annual cost of operating the water system</p> <p>Find</p>	<p>These costs include those for operations, maintenance and any annually incurred costs for long-term upkeep of the drinking water supply and distribution system. It should include the costs of day-to-day upkeep and long-term financing such as repayment of capital bonds for infrastructure expansion or improvement. Typical costs include employee salaries and benefits, materials, equipment, insurance, fees, administrative costs and all other costs that exist to sustain the drinking water supply. Depending upon water utility accounting procedures or regulatory agency requirements, it may be appropriate to include depreciation in the total of this cost. This cost should not include any costs to operate wastewater, biosolids or other systems outside of drinking water.</p>

Item Name	Description								
<p>Unauthorized consumption</p> <p>Find</p>	<p>Includes water illegally withdrawn from fire hydrants, illegal connections, bypasses to customer consumption meters, or tampering with metering or meter reading equipment; as well as any other ways to receive water while thwarting the water utility's ability to collect revenue for the water. Unauthorized consumption results in uncaptured revenue and creates an error that understates customer consumption. In most water utilities this volume is low and, if the water auditor has not yet gathered detailed data for these loss occurrences, it is recommended that the auditor apply a default value of 0.25% of the volume of water supplied. However, if the auditor has investigated unauthorized occurrences, and has well validated data that indicates the volume from unauthorized consumption is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations. Note that a value of zero will not be accepted since all water utilities have some volume of unauthorized consumption occurring in their system.</p> <p>Note: if the auditor selects the default value for unauthorized consumption, a data grading of 5 is automatically assigned, but not displayed on the Reporting Worksheet.</p>								
<p>Unavoidable Annual Real Losses (UARL)</p> <p>Find</p>	<p>UARL (gallons/day)=(5.41Lm + 0.15Nc + 7.5Lc) xP, or UARL (litres/day)=(18.0Lm + 0.8Nc + 25.0Lc) xP</p> <p>where: Lm = length of mains (miles or kilometres) Nc = number of customer service connections Lp = the average distance of customer service connection piping (feet or metres) (see the Worksheet "Service Connection Diagram" for guidance on deterring the value of Lp) Lc = total length of customer service connection piping (miles or km) Lc = Nc X Lp (miles or kilometres) P = Pressure (psi or metres)</p> <p>The UARL is a theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a key variable in the calculation of the Infrastructure Leakage Index (ILI). Striving to reduce system leakage to a level close to the UARL is usually not needed unless the water supply is unusually expensive, scarce or both.</p> <p>NOTE: The UARL calculation has not yet been proven as fully valid for very small, or low pressure water distribution systems. If, in gallons per day: (Lm x 32) + Nc < 3000 or P < 35psi in litres per day: (Lm x 20) + Nc < 3000 or P < 25m then the calculated UARL value may not be valid. The software does not display a value of UARL or ILI if either of these conditions is true.</p>								
<p>Unbilled Authorized Consumption</p>	<p>All consumption that is unbilled, but still authorized by the utility. This includes Unbilled Metered Consumption + Unbilled Unmetered Consumption. See "Authorized Consumption" for more information. For Unbilled Unmetered Consumption, the Free Water Audit Software provides the auditor the option to select a default value if they have not audited unmetered activities in detail. The default calculates a volume that is 1.25% of the Water Supplied volume. If the auditor has carefully audited the various unbilled, unmetered, authorized uses of water, and has established reliable estimates of this collective volume, then he or she may enter the volume directly for this component, and not use the default value.</p>								
<p>Unbilled metered consumption</p> <p>Find</p>	<p>Metered consumption which is authorized by the water utility, but, for any reason, is <u>deemed by utility policy</u> to be unbilled. This might for example include metered water consumed by the utility itself in treatment or distribution operations, or metered water provided to civic institutions free of charge. It does <u>not</u> include water supplied to neighboring utilities (water exported) which may be metered but not billed.</p>								
<p>Unbilled unmetered consumption</p> <p>Find</p>	<p>Any kind of Authorized Consumption which is neither billed or metered. This component typically includes water used in activities such as fire fighting, flushing of water mains and sewers, street cleaning, fire flow tests conducted by the water utility, etc. In most water utilities it is a small component which is very often substantially overestimated. It does NOT include water supplied to neighboring utilities (water exported) which is unmetered and unbilled – an unlikely case. This component has many sub-components of water use which are often tedious to identify and quantify. Because of this, and the fact that it is usually a small portion of the water supplied, it is recommended that the auditor apply the default value, which is 1.25% of the Water Supplied volume. Select the default percentage to enter this value.</p> <p>If the water utility <u>has</u> carefully audited the unbilled, unmetered activities occurring in the system, and has well validated data that gives a value substantially higher or lower than the default volume, then the auditor should enter their own volume. However the default approach is recommended for most water utilities.</p> <p>Note that a value of zero is not permitted, since all water utilities have some volume of water in this component occurring in their system.</p>								
<p>Units and Conversions</p>	<p>The user may develop an audit based on one of three unit selections: 1) Million Gallons (US) 2) Megalitres (Thousand Cubic Metres) 3) Acre-feet Once this selection has been made in the instructions sheet, all calculations are made on the basis of the chosen units. Should the user wish to make additional conversions, a unit converter is provided below (use drop down menus to select units from the yellow unit boxes):</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">Enter Units:</td> <td style="padding: 5px;">Convert From...</td> <td style="padding: 5px;">=</td> <td style="padding: 5px;">Converts to.....</td> </tr> <tr> <td style="text-align: center; padding: 5px;">1</td> <td style="text-align: center; padding: 5px;">Million Gallons (US)</td> <td></td> <td style="text-align: center; padding: 5px;">3.06888329 Acre-feet</td> </tr> </table> <p>(conversion factor = 3.06888328973723)</p> </div>	Enter Units:	Convert From...	=	Converts to.....	1	Million Gallons (US)		3.06888329 Acre-feet
Enter Units:	Convert From...	=	Converts to.....						
1	Million Gallons (US)		3.06888329 Acre-feet						
<p>Use of Option Buttons</p>	<p>To use the default percent value choose this button</p> <p>To enter a value choose this button and enter the value in the cell to the right</p> <div style="text-align: center;"> </div> <p>NOTE: For Unbilled Unmetered Consumption, Unauthorized Consumption and Systematic Data Handling Errors, a recommended default value can be applied by selecting the Percent option. The default values are based on fixed percentages of Water Supplied or Billed Authorized Consumption and are recommended for use in this audit unless the auditor has well validated data for their system. Default values are shown by purple cells, as shown in the example above.</p> <p>If a default value is selected, the user does not need to grade the item; a grading value of 5 is automatically applied (however, this grade will not be displayed).</p>								

Item Name	Description
<p>Variable production cost (applied to Real Losses)</p> <p>Find</p>	<p>The cost to produce and supply the next unit of water (e.g., \$/million gallons). This cost is determined by calculating the summed unit costs for ground and surface water treatment and all power used for pumping from the source to the customer. It may also include other miscellaneous unit costs that apply to the production of drinking water. It should also include the unit cost of bulk water purchased as an import if applicable.</p> <p>It is common to apply this unit cost to the volume of Real Losses. However, if water resources are strained and the ability to meet future drinking water demands is in question, then the water auditor can be justified in applying the Customer Retail Rate to the Real Loss volume, rather than applying the Variable Production Cost.</p> <p>The Free Water Audit Software applies the Variable Production costs to Real Losses by default. However, the auditor has the option on the Reporting Worksheet to select the Customer Retail Cost as the basis for the Real Loss cost evaluation if the auditor determines that this is warranted.</p>
<p>Volume from own sources</p> <p>Find</p>	<p>The volume of water withdrawn (abstracted) from water resources (rivers, lakes, streams, wells, etc) controlled by the water utility, and then treated for potable water distribution. Most water audits are compiled for utility retail water distribution systems, so this volume should reflect the amount of <u>treated</u> drinking water that entered the distribution system. Often the volume of water measured at the effluent of the treatment works is slightly less than the volume measured at the raw water source, since some of the water is used in the treatment process. Thus, it is useful if flows are metered at the effluent of the treatment works. If metering exists only at the raw water source, an adjustment for water used in the treatment process should be included to account for water consumed in treatment operations such as filter backwashing, basin flushing and cleaning, etc. If the audit is conducted for a wholesale water agency that sells untreated water, then this quantity reflects the measure of the raw water, typically metered at the source.</p>
<p>Volume from own sources: Master meter and supply error adjustment</p> <p>Find</p>	<p>An estimate or measure of the degree of inaccuracy that exists in the master (production) meters measuring the annual Volume from own Sources, and any error in the data trail that exists to collect, store and report the summary production data. This adjustment is a weighted average number that represents the collective error for all master meters for all days of the audit year and any errors identified in the data trail. Meter error can occur in different ways. A meter or meters may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Data error can occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of inaccuracy in master meters and data errors in archival systems are common; thus a value of zero should <u>not</u> be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration.</p>
<p>Water exported</p> <p>Find</p>	<p>The Water Exported volume is the bulk water conveyed and sold by the water utility to neighboring water systems that exists outside of their service area. Typically this water is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water utility that is selling the water: i.e. the exporter. If the water utility who is compiling the annual water audit sells bulk water in this manner, they are an exporter of water.</p> <p>Note: The Water Exported volume is sold to wholesale customers who are typically charged a wholesale rate that is different than retail rates charged to the retail customers existing within the service area. Many state regulatory agencies require that the Water Exported volume be reported to them as a quantity separate and distinct from the retail customer billed consumption. For these reasons - and others - the Water Exported volume is always quantified separately from Billed Authorized Consumption in the standard water audit. Be certain not to "double-count" this quantity by including it in both the Water Exported box and the Billed Metered Consumption box of the water audit Reporting Worksheet. This volume should be included only in the Water Exported box.</p>
<p>Water exported: Master meter and supply error adjustment</p> <p>Find</p>	<p>An estimate or measure of the volume in which the Water Exported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived exported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of error in their metered data, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived data. Thus, a value of zero should <u>not</u> be entered. Enter a negative percentage or value for metered data under-registration; or enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment. Corrections to data gaps or other errors found in the archived data should also be included as a portion of this meter error adjustment.</p>
<p>Water imported</p> <p>Find</p>	<p>The Water Imported volume is the bulk water purchased to become part of the Water Supplied volume. Typically this is water purchased from a neighboring water utility or regional water authority, and is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water supplier selling the water to the utility conducting the water audit. The water supplier selling the bulk water usually charges the receiving utility based upon a wholesale water rate.</p>
<p>Water imported: Master meter and supply error adjustment</p> <p>Find</p>	<p>An estimate or measure of the volume in which the Water Imported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived imported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some level of meter inaccuracy, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived metered data. Thus, a value of zero should <u>not</u> be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment.</p>
<p>WATER LOSSES</p> <p>Find</p>	<p>= apparent losses + real losses</p> <p>Water Losses are the difference between Water Supplied and Authorized Consumption. Water losses can be considered as a total volume for the whole system, or for partial systems such as transmission systems, pressure zones or district metered areas (DMA); if one of these configurations are the basis of the water audit.</p>



**AWWA Free Water Audit Software:
Determining Water Loss Standing**

WAS v5.0
American Water Works Association
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Water Audit Report for:
 Reporting Year:
 Data Validity Score:

Water Loss Control Planning Guide

Functional Focus Area	Water Audit Data Validity Level / Score				
	Level I (0-25)	Level II (26-50)	Level III (51-70)	Level IV (71-90)	Level V (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities in gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

Note: this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

**General Guidelines for Setting a Target ILI
(without doing a full economic analysis of leakage control options)**

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
1.0 - 3.0	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
>3.0 -5.0	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term
>5.0 - 8.0	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
Greater than 8.0	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
Less than 1.0	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		



AWWA Water Audit Software Version 5.0 Developed by the Water Loss Control Committee of the American Water Works Association August, 2014

This software is intended to serve as a basic tool to compile a preliminary, or "top-down", water audit. It is recommended that users also refer to the current edition of the AWWA M36 Publication, Water Audits and Loss Control Programs, for detailed guidance on compiling a comprehensive, or "bottom-up", water audit using the same water audit methodology.

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REFERENCES: - Alegre, H., Hirner, W., Baptista, J. and Parena, R. Performance Indicators for Water Supply Services. IWA Publishing 'Manual of Best Practice' Series, 2000. ISBN 1 900222 272
- Kunkel, G. et al, 2003. Water Loss Control Committee Report: Applying Worldwide Best Management Practices in Water Loss Control. Journal AWWA, 95:8:65
- AWWA Water Audits and Loss Control Programs, M36 Publication, 3rd Edition, 2009
- Service Connection Diagrams courtesy of Ronnie McKenzie, WRP Pty Ltd.

VERSION HISTORY: Table with 4 columns: Version, Release Date, Number of Worksheets, Key Features and Developments. Rows include v1 (2005/2006), v2 (2006), v3 (2007), v4-v4.2 (2010), and v5 (2014).

AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:

Email Address:

Telephone (incl Ext.):

Name of City / Utility:

City/Town/Municipality:

State / Province:

Country:

Year:

Start Date: Enter MM/YYYY numeric format

End Date: Enter MM/YYYY numeric format

Audit Preparation Date:

Volume Reporting Units:

PWSID / Other ID:

The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

Instructions

The current sheet. Enter contact information and basic audit details (year, units etc)

Reporting Worksheet

Enter the required data on this worksheet to calculate the water balance and data grading

Comments

Enter comments to explain how values were calculated or to document data sources

Performance Indicators

Review the performance indicators to evaluate the results of the audit

Water Balance

The values entered in the Reporting Worksheet are used to populate the Water Balance

Dashboard

A graphical summary of the water balance and Non-Revenue Water components

Grading Matrix

Presents the possible grading options for each input component of the audit

Service Connection Diagram

Diagrams depicting possible customer service connection line configurations

Definitions

Use this sheet to understand the terms used in the audit process

Loss Control Planning

Use this sheet to interpret the results of the audit validity score and performance indicators

Example Audits

Reporting Worksheet and Performance Indicators examples are shown for two validated audits

Acknowledgements

Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org

[Click to access definition](#)
[Click to add a comment](#)

Water Audit Report for: **San Juan Water District**
 Reporting Year: **2014** **1/2014 - 12/2014**

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

WATER SUPPLIED

----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+ ?	8	11,076.920	acre-ft/yr
Water imported:	+ ?	n/a		acre-ft/yr
Water exported:	+ ?	n/a		acre-ft/yr

Master Meter and Supply Error Adjustments

Pcnt:	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Value:		acre-ft/yr
	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr
	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr

Enter negative % or value for under-registration
 Enter positive % or value for over-registration

WATER SUPPLIED: **11,076.920** acre-ft/yr

AUTHORIZED CONSUMPTION

Billed metered:	+ ?	6	10,444.600	acre-ft/yr
Billed unmetered:	+ ?	10	0.000	acre-ft/yr
Unbilled metered:	+ ?	8	4.280	acre-ft/yr
Unbilled unmetered:	+ ?	8	75.260	acre-ft/yr

Click here: [?](#)
 for help using option buttons below

Pcnt:	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Value:	75.260	acre-ft/yr
-------	-----------------------	----------------------------------	-----------------------	--------	--------	------------

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: **10,524.140** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) **552.780** acre-ft/yr

Apparent Losses

Unauthorized consumption: + ? **27.692** acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	6	105.544	acre-ft/yr
Systematic data handling errors:	+ ?	7	105.000	acre-ft/yr

Apparent Losses: **238.237** acre-ft/yr

Pcnt:	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Value:	0.25%	acre-ft/yr
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Pcnt:	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Value:	1.00%	acre-ft/yr
	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>		105.000	acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **314.543** acre-ft/yr

WATER LOSSES: **552.780** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **632.320** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	8	201.2	miles
Number of active AND inactive service connections:	+ ?	8	10,579	
Service connection density:	+ ?		53	conn./mile main

Are customer meters typically located at the curbside or property line? **No**
Average length of customer service line: + ? 7 **30.0** ft (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average operating pressure: + ? 9 **50.0** psi

COST DATA

Total annual cost of operating water system:	+ ?	10	\$9,774,317	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	10	\$0.80	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	10	\$205.16	\$/acre-ft

Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 79 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Volume from own sources
- 2: Billed metered
- 3: Customer metering inaccuracies

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AWWA Free Water Audit Software:

System Attributes and Performance Indicators

WAS v5.0
 American Water Works Association.

Water Audit Report for: San Juan Water District

Reporting Year: 2014 | 1/2014 - 12/2014

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 79 out of 100 ***

System Attributes:

	Apparent Losses:	238.237	acre-ft/yr
	+ Real Losses:	314.543	acre-ft/yr
	= Water Losses:	552.780	acre-ft/yr
? Unavoidable Annual Real Losses (UARL): 175.09 acre-ft/yr			
	Annual cost of Apparent Losses:	\$83,021	
	Annual cost of Real Losses:	\$64,532	Valued at Variable Production Cost
			Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial:	{	Non-revenue water as percent by volume of Water Supplied:	5.7%	
		Non-revenue water as percent by cost of operating system:	1.7%	Real Losses valued at Variable Production Cost
Operational Efficiency:	{	Apparent Losses per service connection per day:	20.10	gallons/connection/day
		Real Losses per service connection per day:	26.54	gallons/connection/day
		Real Losses per length of main per day*:	N/A	
		Real Losses per service connection per day per psi pressure:	0.53	gallons/connection/day/psi
		From Above, Real Losses = Current Annual Real Losses (CARL):	314.54	acre-feet/year
	?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	1.80	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

General Comment:	
Audit Item	Comment
Volume from own sources:	
Vol. from own sources: Master meter error adjustment:	
Water imported:	
Water imported: master meter error adjustment:	
Water exported:	
Water exported: master meter error adjustment:	
Billed metered:	
Billed unmetered:	
Unbilled metered:	
Unbilled unmetered:	
Unauthorized consumption:	
Customer metering inaccuracies:	
Systematic data handling errors:	
Length of mains:	
Number of active AND inactive service connections:	
Average length of customer service line:	
Average operating pressure:	
Total annual cost of operating water system:	
Customer retail unit cost (applied to Apparent Losses):	
Variable production cost (applied to Real Losses):	



AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	San Juan Water District	
Reporting Year:	2014	1/2014 - 12/2014
Data Validity Score:	79	

	Water Exported	Billed Water Exported				
	<i>0.000</i>		Billed Authorized Consumption	Billed Metered Consumption (water exported is removed)	Revenue Water	
Own Sources (Adjusted for known errors) 11,076.920	Water Supplied 11,076.920	Authorized Consumption 10,524.140	10,444.600	10,444.600	10,444.600	
			Unbilled Authorized Consumption 79.540	0.000	Non-Revenue Water (NRW)	
		Water Losses 552.780	Apparent Losses 238.237	4.280	632.320	
			Real Losses 314.543	75.260		
Water Imported 0.000				27.692		
				105.544		
				105.000		
				Not broken down		
				Not broken down		
				Not broken down		



AWWA Free Water Audit Software: Dashboard

WAS v5.0

American Water Works Association.

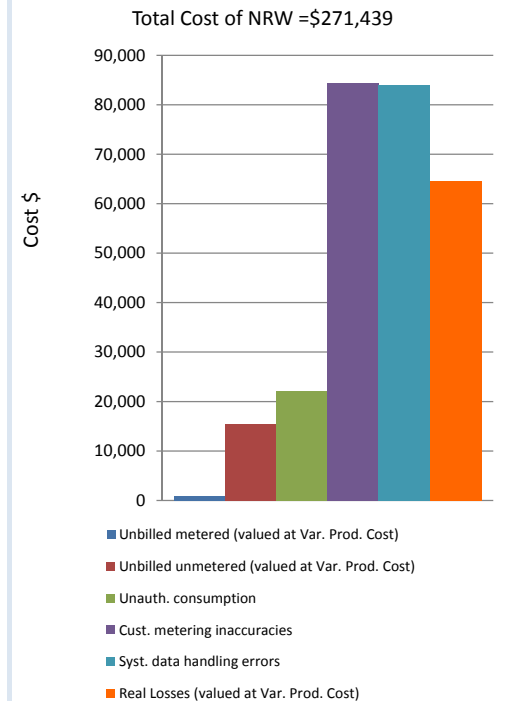
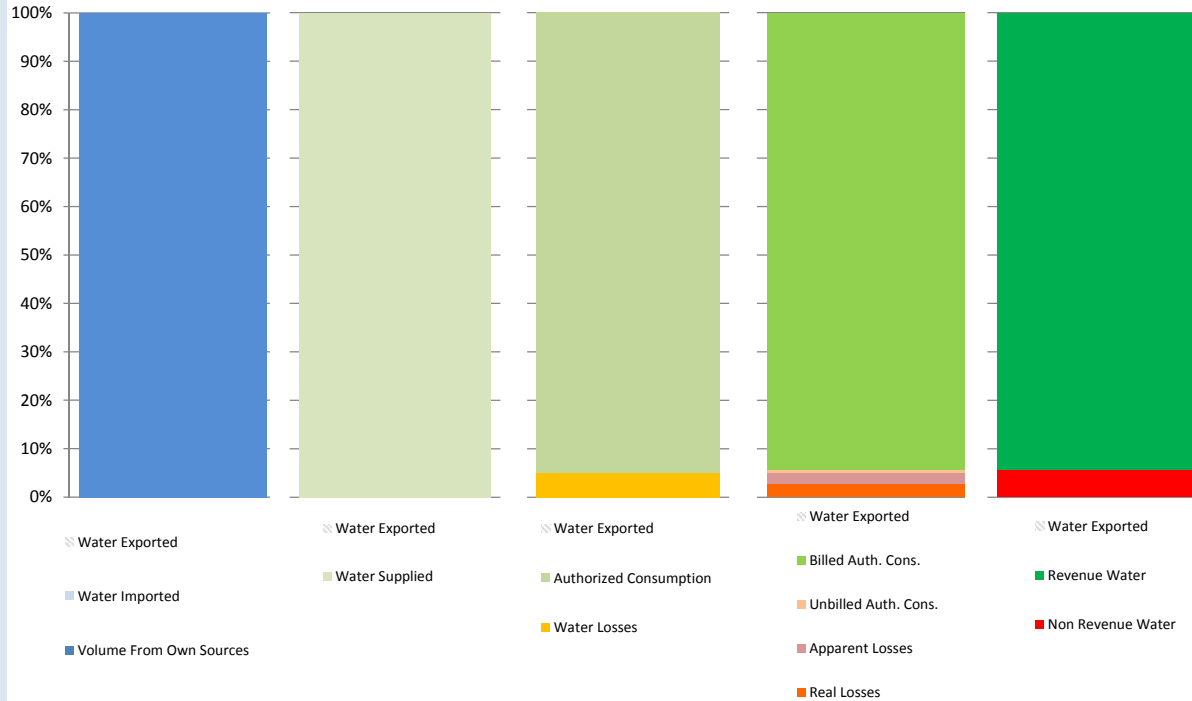
The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

Water Audit Report for: **San Juan Water District**

Reporting Year: **2014** **1/2014 - 12/2014**

Data Validity Score: **79**

- Show me the VOLUME of Non-Revenue Water
 Show me the COST of Non-Revenue Water



AWWA Free Water Audit Software: Grading Matrix											
The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red											
Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
WATER SUPPLIED											
Volume from own sources:	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		to qualify for 2: Organize and launch efforts to collect data for determining volume from own sources	to qualify for 4: Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		to qualify for 6: Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		to qualify for 8: Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system; tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimates of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected, and/or errors confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and sources meters ensures minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	to qualify for 4: Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		to qualify for 6: Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		to qualify for 8: Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		to qualify for 10: Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
Water Imported:	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/imported water)	Less than 25% of imported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Imported Volume" component:	(Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.)	to qualify for 2: Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	to qualify for 4: Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered/imported water interconnections and replace obsolete/defective meters.		to qualify for 6: Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		to qualify for 8: Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is unmetered, with imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly Imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected, and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous Imported supply metered flow data is logged automatically & reviewed each business day by the Importer. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	to qualify for 4: Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.		to qualify for 6: Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		to qualify for 8: Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		to qualify for 10: Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility; at least every five years.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually. Less than 10% of meters are found outside of +/- 6% accuracy.	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component: <i>(Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.)</i>		to qualify for 2: Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	To qualify for 4: Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmetered exported water interconnections and replace obsolete/defective meters		to qualify for 6: Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmetered exported water interconnections and replacement of obsolete/defective meters.		to qualify for 8: Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis, with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected, and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component:		<p>to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.</p>	<p>to qualify for 4: Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.</p>		<p>to qualify for 6: Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.</p>		<p>to qualify for 8: Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.</p>		<p>to qualify for 10: Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities; at least every five years.</p>		<p>to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.</p>
AUTHORIZED CONSUMPTION											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted with less than 50% meter read success rate, remaining accounts' consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter records. Regular meter accuracy testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; at minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials undertaken. Statistically significant customer meter testing and replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component:	If n/a is selected because the customer population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.	to qualify for 4: Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.		to qualify for 6: Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.		to qualify for 8: Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.		to qualify for 10: Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.		to maintain 10: Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter; i.e. no intentionally unmetered accounts exist	Water utility policy does <u>not</u> require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does <u>not</u> require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy <u>does</u> require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy <u>does</u> require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy <u>does</u> require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy <u>does</u> require metering and volume based billing for all customer accounts. Less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		<p>to qualify for 2: Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.</p>	<p>to qualify for 4: Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.</p>		<p>to qualify for 6: Refine policy and procedures to improve customer metering participation for all but solidly exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significantly reduce the number of unmetered accounts</p>		<p>to qualify for 8: Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.</p>		<p>to qualify for 10: Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.</p>		<p>to maintain 10: Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.</p>
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	<p>Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist; and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.</p>	<p>Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.</p>	Conditions between 2 and 4	<p>Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.</p>	Conditions between 4 and 6	<p>Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.</p>	Conditions between 6 and 8	<p>Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.</p>	Conditions between 8 and 10	<p>Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.</p>
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		<p>to qualify for 2: Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.</p>	<p>to qualify for 4: Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.</p>		<p>to qualify for 6: Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.</p>		<p>to qualify for 8: Communicate billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.</p>		<p>to qualify for 10: Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.</p>		<p>to maintain 10: Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.</p>
Unbilled unmetered:		<p>Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.</p>	<p>Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.</p>	Conditions between 2 and 4	<p>Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).</p>	Default value of 1.25% of system input volume is employed	<p>Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.</p>	Conditions between 6 and 8	<p>Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.</p>	Conditions between 8 and 10	<p>Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.</p>
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		<p>to qualify for 5: Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use.</p> <p>to qualify for 2: Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushing).</p>	<p>to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use.</p> <p>to qualify for 4: Evaluate the documentation of events that have been observed. Meet with user groups (ex: for fire hydrants - fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).</p>		<p>to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, unmetered consumption is usually a relatively small quantity component, and other larger-quantity components should take priority.</p>	<p>to qualify for 6 or greater: Finalize policy and begin to conduct field checks for water utilities who are to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.</p>	<p>to qualify for 8: Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.</p>		<p>to qualify for 10: Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.</p>		<p>to maintain 10: Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.</p>

APPARENT LOSSES

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters) but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		to qualify for 5: Use accepted default of 0.25% of volume of water supplied. to qualify for 2: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	to qualify for 5: Use accepted default of 0.25% of system input volume to qualify for 4: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		to qualify for 5: Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	to qualify for 6 or greater: Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	to qualify for 6: Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		to qualify for 10: Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		to maintain 10: Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying ages and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	to qualify for 4: Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		to qualify for 6: Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		to qualify for 8: Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		to qualify for 9: Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	to qualify for 10: Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	to maintain 10: Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetered customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but need refinement. Computerized billing system exists, but is dated or lacks needed functionality. Periodic limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal checks conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		to qualify for 2: Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	to qualify for 4: Finalize written policy and procedures for activation of new billing accounts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		to qualify for 6: Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Procedurize internal annual audit process.		to qualify for 8: Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		to qualify for 10: Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		to maintain 10: Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
SYSTEM DATA											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in a uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographic Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		to qualify for 2: Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	to qualify for 4: Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		to qualify for 6: Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		to qualify for 8: Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		to qualify for 10: Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		to maintain 10: Continue with standardization and random field validation to improve the completeness and accuracy of the system.
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	Note: The number of Service Connections does not include fire hydrant leads/fines connecting the hydrant to the water main	to qualify for 2: Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	to qualify for 4: Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		to qualify for 6: Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		to qualify for 8: Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		to qualify for 10: Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		to maintain 10: Continue with standardization and random field validation to improve knowledge of system.
	Note: if customer water meters are located outside	Gratings 1-9 apply if customer properties are unmetered, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex faucet) or the customer meter must be quantified. Gratings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									Either of two conditions can be met for a grading of 10:

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Average length of customer service line:	Meters are not the domain of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility; and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate, well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Working asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet. b). Meters exist inside customer buildings, or properties are unmetered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		to qualify for 2: Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	to qualify for 4: Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		to qualify for 6: Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		to qualify for 8: Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		to qualify for 10: Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		to maintain 10: Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system, occasional open boundary valves are discovered that breach pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breach pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar realtime monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones. SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.
Improvements to attain higher data grading for "Average Operating Pressure" component:		to qualify for 2: Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	to qualify for 4: Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		to qualify for 6: Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		to qualify for 8: Install a Supervisory Control and Data Acquisition (SCADA) System, or similar realtime monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		to qualify for 10: Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		to maintain 10: Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for realtime pressure data calibration, and averaging.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
COST DATA											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		<u>to qualify for 2:</u> Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		<u>to qualify for 8:</u> Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmeasured, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented, resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		<u>to qualify for 2:</u> Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	<u>to qualify for 4:</u> Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		<u>to qualify for 6:</u> Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	<u>Launch effort to fully meter the customer population and charge rates based upon water volumes</u>	<u>to qualify for 8:</u> Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to qualify for 10:</u> Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to maintain 10:</u> Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: If the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis. or: 2) Water supply is entirely purchased as bulk imported water, and unit purchase cost serves as the variable production cost.
Improvements to attain higher data grading for "Variable Production Costs" component:		<u>to qualify for 2:</u> Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		<u>to qualify for 8:</u> Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.). Arrange to conduct audits by a knowledgeable third-party at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively



Average Length of Customer Service Line

The three figures shown on this worksheet display the assignment of the Average Length of Customer Service Line, L_p , for the three most common piping configurations.

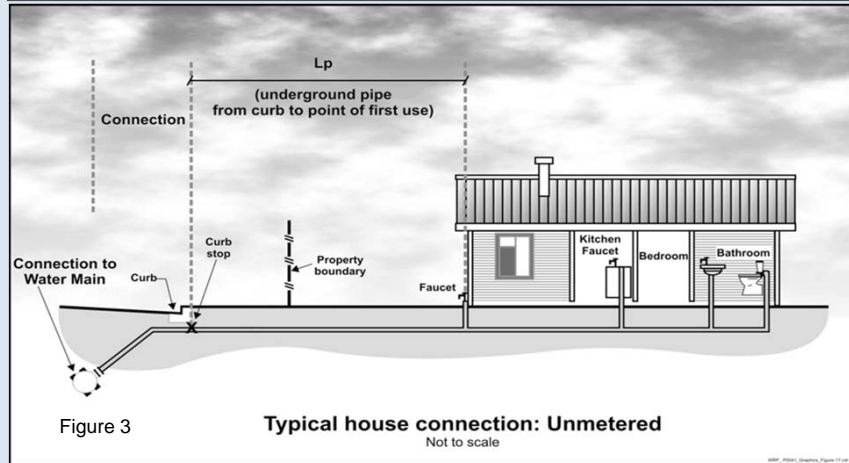
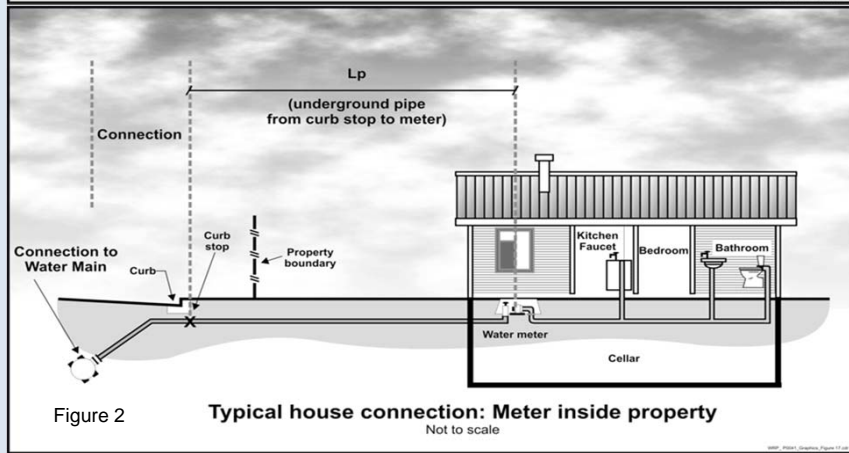
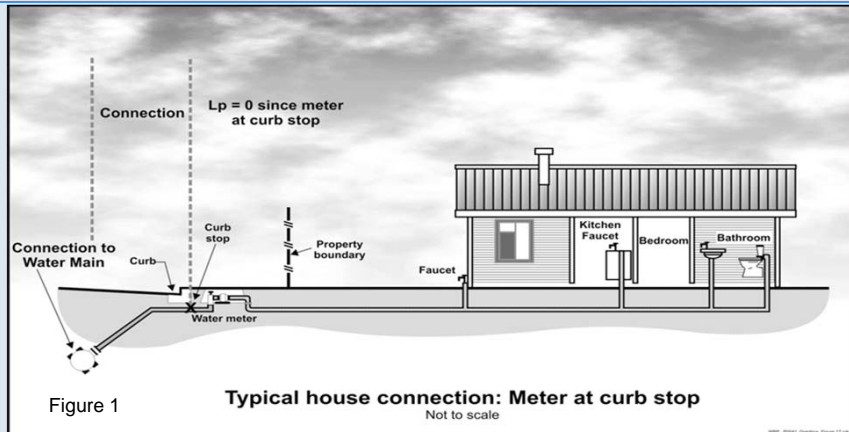
Figure 1 shows the configuration of the water meter outside of the customer building next to the curb stop valve. In this configuration $L_p = 0$ since the distance between the curb stop and the customer metering point is essentially zero.

Figure 2 shows the configuration of the customer water meter located inside the customer building, where L_p is the distance from the curb stop to the water meter.

Figure 3 shows the configuration of an unmetered customer building, where L_p is the distance from the curb stop to the first point of customer water consumption, or, more simply, the building line.

In any water system the L_p will vary notably in a community of different structures, therefore the average L_p value is used and this should be approximated or calculated if a sample of service line measurements has been gathered.

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Item Name	Description
<p>Apparent Losses</p> <p>Find</p>	<p>= unauthorized consumption + customer metering inaccuracies + systematic data handling errors</p> <p>Apparent Losses include all types of inaccuracies associated with customer metering (worn meters as well as improperly sized meters or wrong type of meter for the water usage profile) as well as systematic data handling errors (meter reading, billing, archiving and reporting), plus unauthorized consumption (theft or illegal use). NOTE: Over-estimation of Apparent Losses results in under-estimation of Real Losses. Under-estimation of Apparent Losses results in over-estimation of Real Losses.</p>
<p>AUTHORIZED CONSUMPTION</p> <p>Find</p>	<p>= billed water exported + billed metered + billed unmetered + unbilled metered + unbilled unmetered consumption</p> <p>The volume of metered and/or unmetered water taken by registered customers, the water utility's own uses, and uses of others who are implicitly or explicitly authorized to do so by the water utility; for residential, commercial, industrial and public-minded purposes.</p> <p>Typical retail customers' consumption is tabulated usually from established customer accounts as billed metered consumption, or - for unmetered customers - billed unmetered consumption. These types of consumption, along with billed water exported, provide revenue potential for the water utility. Be certain to tabulate the water exported volume as a separate component and do not "double-count" it by including in the billed metered consumption component as well as the water exported component.</p> <p>Unbilled authorized consumption occurs typically in non-account uses, including water for fire fighting and training, flushing of water mains and sewers, street cleaning, watering of municipal gardens, public fountains, or similar public-minded uses. Occasionally these uses may be metered and billed (or charged a flat fee), but usually they are unmetered and unbilled. In the latter case, the water auditor may use a default value to estimate this quantity, or implement procedures for the reliable quantification of these uses. This starts with documenting usage events as they occur and estimating the amount of water used in each event. (See Unbilled unmetered consumption)</p>
<p>View Service Connection Diagram</p> <p>Average length of customer service line</p> <p>Find</p>	<p>This is the average length of customer service line, Lp, that is owned and maintained by the customer; from the point of ownership transfer to the customer water meter, or building line (if unmetered). The quantity is one of the data inputs for the calculation of Unavoidable Annual Real Losses (UARL), which serves as the denominator of the performance indicator: Infrastructure Leakage Index (ILI). The value of Lp is multiplied by the number of customer service connections to obtain a total length of customer owned piping in the system. The purpose of this parameter is to account for the unmetered service line infrastructure that is the responsibility of the customer for arranging repairs of leaks that occur on their lines. In many cases leak repairs arranged by customers take longer to be executed than leak repairs arranged by the water utility on utility-maintained piping. Leaks run longer - and lose more water - on customer-owned service piping, than utility owned piping.</p> <p>If the customer water meter exists near the ownership transfer point (usually the curb stop located between the water main and the customer premises) this distance is zero because the meter and transfer point are the same. This is the often encountered configuration of customer water meters located in an underground meter box or "pit" outside of the customer's building. The Free Water Audit Software asks a "Yes/No" question about the meter at this location. If the auditor selects "Yes" then this distance is set to zero and the data grading score for this component is set to 10.</p> <p>If water meters are typically located inside the customer premise/building, or properties are unmetered, it is up to the water auditor to estimate a system-wide average Lp length based upon the various customer land parcel sizes and building locations in the service area. Lp will be a shorter length in areas of high density housing, and a longer length in areas of low density housing and varied commercial and industrial buildings. General parcel demographics should be employed to obtain a composite average Lp length for the entire system.</p> <p>Refer to the "Service Connection Diagram" worksheet for a depiction of the service line/metering configurations that typically exist in water utilities. This worksheet gives guidance on the determination of the Average Length, Lp, for each configuration.</p>
<p>Average operating pressure</p> <p>Find</p>	<p>This is the average pressure in the distribution system that is the subject of the water audit. Many water utilities have a calibrated hydraulic model of their water distribution system. For these utilities, the hydraulic model can be utilized to obtain a very accurate quantity of average pressure. In the absence of a hydraulic model, the average pressure may be approximated by obtaining readings of static water pressure from a representative sample of fire hydrants or other system access points evenly located across the system. A weighted average of the pressure can be assembled; but be sure to take into account the elevation of the fire hydrants, which typically exist several feet higher than the level of buried water pipelines. If the water utility is compiling the water audit for the first time, the average pressure can be approximated, but with a low data grading. In subsequent years of auditing, effort should be made to improve the accuracy of the average pressure quantity. This will then qualify the value for a higher data grading.</p>
<p>Billed Authorized Consumption</p>	<p>All consumption that is billed and authorized by the utility. This may include both metered and unmetered consumption. See "Authorized Consumption" for more information.</p>
<p>Billed metered consumption</p> <p>Find</p>	<p>All metered consumption which is billed to retail customers, including all groups of customers such as domestic, commercial, industrial or institutional. It does NOT include water supplied to neighboring utilities (water exported) which is metered and billed. Be sure to subtract any consumption for exported water sales that may be included in these billing roles. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component. The metered consumption data can be taken directly from billing records for the water audit period. The accuracy of yearly metered consumption data can be refined by including an adjustment to account for customer meter reading lag time since not all customer meters are read on the same day of the meter reading period. However additional analysis is necessary to determine the lag time adjustment value, which may or may not be significant.</p>
<p>Billed unmetered consumption</p> <p>Find</p>	<p>All billed consumption which is calculated based on estimates or norms from water usage sites that have been determined by utility policy to be left unmetered. This is typically a very small component in systems that maintain a policy to meter their customer population. However, this quantity can be the key consumption component in utilities that have not adopted a universal metering policy. This component should NOT include any water that is supplied to neighboring utilities (water exported) which is unmetered but billed. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component.</p>
<p>Customer metering inaccuracies</p> <p>Find</p>	<p>Apparent water losses caused by the collective under-registration of customer water meters. Many customer water meters gradually wear as large cumulative volumes of water are passed through them over time. This causes the meters to under-register the flow of water. This occurrence is common with smaller residential meters of sizes 5/8-inch and 3/4 inch after they have registered very large cumulative volumes of water, which generally occurs only after periods of years. For meters sized 1-inch and larger - typical of multi-unit residential, commercial and industrial accounts - meter under-registration can occur from wear or from the improper application of the meter; i.e. installing the wrong type of meter or the wrong size of meter, for the flow pattern (profile) of the consumer. For instance, many larger meters have reduced accuracy at low flows. If an oversized meter is installed, most of the time the routine flow will occur in the low flow range of the meter, and a significant portion of it may not be registered. It is important to properly select and install all meters, but particularly large customer meters, size 1-inch and larger.</p> <p>The auditor has two options for entering data for this component of the audit. The auditor can enter a percentage under-registration (typically an estimated value), this will apply the selected percentage to the two categories of metered consumption to determine the volume of water not recorded due to customer meter inaccuracy. Note that this percentage is a composite average inaccuracy for all customer meters in the entire meter population. The percentage will be multiplied by the sum of the volumes in the Billed Metered and Unbilled Metered components. Alternatively, if the auditor has substantial data from meter testing activities, he or she can calculate their own loss volumes, and this volume may be entered directly.</p> <p>Note that a value of zero will be accepted but an alert will appear asking if the customer population is unmetered. Since all metered systems have some degree of inaccuracy, a positive value should be entered. A value of zero in this component is valid only if the water utility does not meter its customer population.</p>

Item Name	Description
Customer retail unit cost <input type="button" value="Find"/>	<p>The Customer Retail Unit Cost represents the charge that customers pay for water service. This unit cost is applied routinely to the components of Apparent Loss, since these losses represent water reaching customers but not (fully) paid for. Since most water utilities have a rate structure that includes a variety of different costs based upon class of customer, a weighted average of individual costs and number of customer accounts in each class can be calculated to determine a single composite cost that should be entered into this cell. Finally, the weighted average cost should also include additional charges for sewer, storm water or biosolids processing, <u>but only if</u> these charges are based upon the volume of potable water consumed.</p> <p>For water utilities in regions with limited water resources and a questionable ability to meet the drinking water demands in the future, the Customer Retail Unit Cost might also be applied to value the Real Losses; instead of applying the Variable Production Cost to Real Losses. In this way, it is assumed that every unit volume of leakage reduced by leakage management activities will be sold to a customer.</p> <p>Note: the Free Water Audit Software allows the user to select the units that are charged to customers (either \$/1,000 gallons, \$/hundred cubic feet, or \$/1,000 litres) and automatically converts these units to the units that appear in the "WATER SUPPLIED" box. The monetary units are United States dollars, \$.</p>
Infrastructure Leakage Index (ILI) <input type="button" value="Find"/>	<p>The ratio of the Current Annual Real Losses (Real Losses) to the Unavoidable Annual Real Losses (UARL). The ILI is a highly effective performance indicator for comparing (benchmarking) the performance of utilities in operational management of real losses.</p>
Length of mains <input type="button" value="Find"/>	<p>Length of all pipelines (except service connections) in the system starting from the point of system input metering (for example at the outlet of the treatment plant). It is also recommended to include in this measure the total length of fire hydrant lead pipe. Hydrant lead pipe is the pipe branching from the water main to the fire hydrant. Fire hydrant leads are typically of a sufficiently large size that is more representative of a pipeline than a service connection. The average length of hydrant leads across the entire system can be assumed if not known, and multiplied by the number of fire hydrants in the system, which can also be assumed if not known. This value can then be added to the total pipeline length. Total length of mains can therefore be calculated as:</p> $\text{Length of Mains, miles} = (\text{total pipeline length, miles}) + [\{ (\text{average fire hydrant lead length, ft}) \times (\text{number of fire hydrants}) \} / 5,280 \text{ ft/mile}]$ <p style="text-align: center;">or</p> $\text{Length of Mains, kilometres} = (\text{total pipeline length, kilometres}) + [\{ (\text{average fire hydrant lead length, metres}) \times (\text{number of fire hydrants}) \} / 1,000 \text{ metres/kilometre}]$
NON-REVENUE WATER <input type="button" value="Find"/>	<p>= Apparent Losses + Real Losses + Unbilled Metered Consumption + Unbilled Unmetered Consumption. This is water which does not provide revenue potential to the utility.</p>
Number of active AND inactive service connections <input type="button" value="Find"/>	<p>Number of customer service connections, extending from the water main to supply water to a customer. Please note that this includes the actual number of distinct piping connections, including fire connections, whether active or inactive. This may differ substantially from the number of customers (or number of accounts). Note: this number does not include the pipeline leads to fire hydrants - the total length of piping supplying fire hydrants should be included in the "Length of mains" parameter.</p>
Real Losses <input type="button" value="Find"/>	<p>Physical water losses from the pressurized system (water mains and customer service connections) and the utility's storage tanks, up to the point of customer consumption. In metered systems this is the customer meter, in unmetered situations this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows.</p>
Revenue Water	<p>Those components of System Input Volume that are billed and have the potential to produce revenue.</p>
Service Connection Density <input type="button" value="Find"/>	<p>=number of customer service connections / length of mains</p>
Systematic data handling errors <input type="button" value="Find"/>	<p>Apparent losses caused by accounting omissions, errant computer programming, gaps in policy, procedure, and permitting/activation of new accounts; and any type of data lapse that results in under-stated customer water consumption in summary billing reports.</p> <p>Systematic Data Handling Errors result in a direct loss of revenue potential. Water utilities can find "lost" revenue by keying on this component.</p> <p>Utilities typically measure water consumption registered by water meters at customer premises. The meter should be read routinely (ex: monthly) and the data transferred to the Customer Billing System, which generates and sends a bill to the customer. Data Transfer Errors result in the consumption value being less than the actual consumption, creating an apparent loss. Such error might occur from illegible and mis-recorded hand-written readings compiled by meter readers, inputting an incorrect meter register unit conversion factor in the automatic meter reading equipment, or a variety of similar errors.</p> <p>Apparent losses also occur from Data Analysis Errors in the archival and data reporting processes of the Customer Billing System. Inaccurate estimates used for accounts that fail to produce a meter reading are a common source of error. Billing adjustments may award customers a rightful monetary credit, but do so by creating a negative value of consumption, thus under-stating the actual consumption. Account activation lapses may allow new buildings to use water for months without meter readings and billing. Poor permitting and construction inspection practices can result in a new building lacking a billing account, a water meter and meter reading; i.e., the customer is unknown to the utility's billing system.</p> <p>Close auditing of the permitting, metering, meter reading, billing and reporting processes of the water consumption data trail can uncover data management gaps that create volumes of systematic data handling error. Utilities should routinely analyze customer billing records to detect data anomalies and quantify these losses. For example, a billing account that registers zero consumption for two or more billing cycles should be checked to explain why usage has seemingly halted. Given the revenue loss impacts of these losses, water utilities are well-justified in providing continuous oversight and timely correction of data transfer errors & data handling errors.</p> <p>If the water auditor has not yet gathered detailed data or assessment of systematic data handling error, it is recommended that the auditor apply the default value of 0.25% of the Billed Authorized Consumption volume. However, if the auditor has investigated the billing system and its controls, and has well validated data that indicates the volume from systematic data handling error is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations and select an appropriate grading. Note: negative values are not allowed for this audit component. If the auditor enters zero for this component then a grading of 1 will be automatically assigned.</p>
Total annual cost of operating the water system <input type="button" value="Find"/>	<p>These costs include those for operations, maintenance and any annually incurred costs for long-term upkeep of the drinking water supply and distribution system. It should include the costs of day-to-day upkeep and long-term financing such as repayment of capital bonds for infrastructure expansion or improvement. Typical costs include employee salaries and benefits, materials, equipment, insurance, fees, administrative costs and all other costs that exist to sustain the drinking water supply. Depending upon water utility accounting procedures or regulatory agency requirements, it may be appropriate to include depreciation in the total of this cost. This cost should not include any costs to operate wastewater, biosolids or other systems outside of drinking water.</p>

Item Name	Description								
<p>Unauthorized consumption</p> <p>Find</p>	<p>Includes water illegally withdrawn from fire hydrants, illegal connections, bypasses to customer consumption meters, or tampering with metering or meter reading equipment; as well as any other ways to receive water while thwarting the water utility's ability to collect revenue for the water. Unauthorized consumption results in uncaptured revenue and creates an error that understates customer consumption. In most water utilities this volume is low and, if the water auditor has not yet gathered detailed data for these loss occurrences, it is recommended that the auditor apply a default value of 0.25% of the volume of water supplied. However, if the auditor has investigated unauthorized occurrences, and has well validated data that indicates the volume from unauthorized consumption is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations. Note that a value of zero will not be accepted since all water utilities have some volume of unauthorized consumption occurring in their system.</p> <p>Note: if the auditor selects the default value for unauthorized consumption, a data grading of 5 is automatically assigned, but not displayed on the Reporting Worksheet.</p>								
<p>Unavoidable Annual Real Losses (UARL)</p> <p>Find</p>	<p>UARL (gallons/day)=(5.41Lm + 0.15Nc + 7.5Lc) xP, or UARL (litres/day)=(18.0Lm + 0.8Nc + 25.0Lc) xP</p> <p>where: Lm = length of mains (miles or kilometres) Nc = number of customer service connections Lp = the average distance of customer service connection piping (feet or metres) (see the Worksheet "Service Connection Diagram" for guidance on deterring the value of Lp) Lc = total length of customer service connection piping (miles or km) Lc = Nc X Lp (miles or kilometres) P = Pressure (psi or metres)</p> <p>The UARL is a theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a key variable in the calculation of the Infrastructure Leakage Index (ILI). Striving to reduce system leakage to a level close to the UARL is usually not needed unless the water supply is unusually expensive, scarce or both.</p> <p>NOTE: The UARL calculation has not yet been proven as fully valid for very small, or low pressure water distribution systems. If, in gallons per day: (Lm x 32) + Nc < 3000 or P < 35psi in litres per day: (Lm x 20) + Nc < 3000 or P < 25m then the calculated UARL value may not be valid. The software does not display a value of UARL or ILI if either of these conditions is true.</p>								
<p>Unbilled Authorized Consumption</p>	<p>All consumption that is unbilled, but still authorized by the utility. This includes Unbilled Metered Consumption + Unbilled Unmetered Consumption. See "Authorized Consumption" for more information. For Unbilled Unmetered Consumption, the Free Water Audit Software provides the auditor the option to select a default value if they have not audited unmetered activities in detail. The default calculates a volume that is 1.25% of the Water Supplied volume. If the auditor has carefully audited the various unbilled, unmetered, authorized uses of water, and has established reliable estimates of this collective volume, then he or she may enter the volume directly for this component, and not use the default value.</p>								
<p>Unbilled metered consumption</p> <p>Find</p>	<p>Metered consumption which is authorized by the water utility, but, for any reason, is <u>deemed by utility policy</u> to be unbilled. This might for example include metered water consumed by the utility itself in treatment or distribution operations, or metered water provided to civic institutions free of charge. It does <u>not</u> include water supplied to neighboring utilities (water exported) which may be metered but not billed.</p>								
<p>Unbilled unmetered consumption</p> <p>Find</p>	<p>Any kind of Authorized Consumption which is neither billed or metered. This component typically includes water used in activities such as fire fighting, flushing of water mains and sewers, street cleaning, fire flow tests conducted by the water utility, etc. In most water utilities it is a small component which is very often substantially overestimated. It does NOT include water supplied to neighboring utilities (water exported) which is unmetered and unbilled – an unlikely case. This component has many sub-components of water use which are often tedious to identify and quantify. Because of this, and the fact that it is usually a small portion of the water supplied, it is recommended that the auditor apply the default value, which is 1.25% of the Water Supplied volume. Select the default percentage to enter this value.</p> <p>If the water utility <u>has</u> carefully audited the unbilled, unmetered activities occurring in the system, and has well validated data that gives a value substantially higher or lower than the default volume, then the auditor should enter their own volume. However the default approach is recommended for most water utilities.</p> <p>Note that a value of zero is not permitted, since all water utilities have some volume of water in this component occurring in their system.</p>								
<p>Units and Conversions</p>	<p>The user may develop an audit based on one of three unit selections: 1) Million Gallons (US) 2) Megalitres (Thousand Cubic Metres) 3) Acre-feet Once this selection has been made in the instructions sheet, all calculations are made on the basis of the chosen units. Should the user wish to make additional conversions, a unit converter is provided below (use drop down menus to select units from the yellow unit boxes):</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td>Enter Units:</td> <td>Convert From...</td> <td>=</td> <td>Converts to.....</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Million Gallons (US)</td> <td></td> <td style="text-align: center;">3.06888329 Acre-feet</td> </tr> </table> <p>(conversion factor = 3.06888328973723)</p> </div>	Enter Units:	Convert From...	=	Converts to.....	1	Million Gallons (US)		3.06888329 Acre-feet
Enter Units:	Convert From...	=	Converts to.....						
1	Million Gallons (US)		3.06888329 Acre-feet						
<p>Use of Option Buttons</p>	<p>To use the default percent value choose this button</p> <p>To enter a value choose this button and enter the value in the cell to the right</p> <div style="text-align: center;"> </div> <p>NOTE: For Unbilled Unmetered Consumption, Unauthorized Consumption and Systematic Data Handling Errors, a recommended default value can be applied by selecting the Percent option. The default values are based on fixed percentages of Water Supplied or Billed Authorized Consumption and are recommended for use in this audit unless the auditor has well validated data for their system. Default values are shown by purple cells, as shown in the example above.</p> <p>If a default value is selected, the user does not need to grade the item; a grading value of 5 is automatically applied (however, this grade will not be displayed).</p>								

Item Name	Description
<p>Variable production cost (applied to Real Losses)</p> <p>Find</p>	<p>The cost to produce and supply the next unit of water (e.g., \$/million gallons). This cost is determined by calculating the summed unit costs for ground and surface water treatment and all power used for pumping from the source to the customer. It may also include other miscellaneous unit costs that apply to the production of drinking water. It should also include the unit cost of bulk water purchased as an import if applicable.</p> <p>It is common to apply this unit cost to the volume of Real Losses. However, if water resources are strained and the ability to meet future drinking water demands is in question, then the water auditor can be justified in applying the Customer Retail Rate to the Real Loss volume, rather than applying the Variable Production Cost.</p> <p>The Free Water Audit Software applies the Variable Production costs to Real Losses by default. However, the auditor has the option on the Reporting Worksheet to select the Customer Retail Cost as the basis for the Real Loss cost evaluation if the auditor determines that this is warranted.</p>
<p>Volume from own sources</p> <p>Find</p>	<p>The volume of water withdrawn (abstracted) from water resources (rivers, lakes, streams, wells, etc) controlled by the water utility, and then treated for potable water distribution. Most water audits are compiled for utility retail water distribution systems, so this volume should reflect the amount of <u>treated</u> drinking water that entered the distribution system. Often the volume of water measured at the effluent of the treatment works is slightly less than the volume measured at the raw water source, since some of the water is used in the treatment process. Thus, it is useful if flows are metered at the effluent of the treatment works. If metering exists only at the raw water source, an adjustment for water used in the treatment process should be included to account for water consumed in treatment operations such as filter backwashing, basin flushing and cleaning, etc. If the audit is conducted for a wholesale water agency that sells untreated water, then this quantity reflects the measure of the raw water, typically metered at the source.</p>
<p>Volume from own sources: Master meter and supply error adjustment</p> <p>Find</p>	<p>An estimate or measure of the degree of inaccuracy that exists in the master (production) meters measuring the annual Volume from own Sources, and any error in the data trail that exists to collect, store and report the summary production data. This adjustment is a weighted average number that represents the collective error for all master meters for all days of the audit year and any errors identified in the data trail. Meter error can occur in different ways. A meter or meters may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Data error can occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of inaccuracy in master meters and data errors in archival systems are common; thus a value of zero should <u>not</u> be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration.</p>
<p>Water exported</p> <p>Find</p>	<p>The Water Exported volume is the bulk water conveyed and sold by the water utility to neighboring water systems that exists outside of their service area. Typically this water is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water utility that is selling the water: i.e. the exporter. If the water utility who is compiling the annual water audit sells bulk water in this manner, they are an exporter of water.</p> <p>Note: The Water Exported volume is sold to wholesale customers who are typically charged a wholesale rate that is different than retail rates charged to the retail customers existing within the service area. Many state regulatory agencies require that the Water Exported volume be reported to them as a quantity separate and distinct from the retail customer billed consumption. For these reasons - and others - the Water Exported volume is always quantified separately from Billed Authorized Consumption in the standard water audit. Be certain not to "double-count" this quantity by including it in both the Water Exported box and the Billed Metered Consumption box of the water audit Reporting Worksheet. This volume should be included only in the Water Exported box.</p>
<p>Water exported: Master meter and supply error adjustment</p> <p>Find</p>	<p>An estimate or measure of the volume in which the Water Exported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived exported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of error in their metered data, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived data. Thus, a value of zero should <u>not</u> be entered. Enter a negative percentage or value for metered data under-registration; or enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment. Corrections to data gaps or other errors found in the archived data should also be included as a portion of this meter error adjustment.</p>
<p>Water imported</p> <p>Find</p>	<p>The Water Imported volume is the bulk water purchased to become part of the Water Supplied volume. Typically this is water purchased from a neighboring water utility or regional water authority, and is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water supplier selling the water to the utility conducting the water audit. The water supplier selling the bulk water usually charges the receiving utility based upon a wholesale water rate.</p>
<p>Water imported: Master meter and supply error adjustment</p> <p>Find</p>	<p>An estimate or measure of the volume in which the Water Imported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived imported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some level of meter inaccuracy, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived metered data. Thus, a value of zero should <u>not</u> be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment.</p>
<p>WATER LOSSES</p> <p>Find</p>	<p>= apparent losses + real losses</p> <p>Water Losses are the difference between Water Supplied and Authorized Consumption. Water losses can be considered as a total volume for the whole system, or for partial systems such as transmission systems, pressure zones or district metered areas (DMA); if one of these configurations are the basis of the water audit.</p>



**AWWA Free Water Audit Software:
Determining Water Loss Standing**

WAS v5.0
American Water Works Association.
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Water Audit Report for:
 Reporting Year:
 Data Validity Score:

Water Loss Control Planning Guide

Functional Focus Area	Water Audit Data Validity Level / Score				
	Level I (0-25)	Level II (26-50)	Level III (51-70)	Level IV (71-90)	Level V (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities in gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

Note: this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

**General Guidelines for Setting a Target ILI
(without doing a full economic analysis of leakage control options)**

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
1.0 - 3.0	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
>3.0 -5.0	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term
>5.0 - 8.0	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
Greater than 8.0	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
Less than 1.0	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		



AWWA Water Audit Software Version 5.0 Developed by the Water Loss Control Committee of the American Water Works Association August, 2014

This software is intended to serve as a basic tool to compile a preliminary, or "top-down", water audit. It is recommended that users also refer to the current edition of the AWWA M36 Publication, Water Audits and Loss Control Programs, for detailed guidance on compiling a comprehensive, or "bottom-up", water audit using the same water audit methodology.

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REFERENCES: - Alegre, H., Hirner, W., Baptista, J. and Parena, R. Performance Indicators for Water Supply Services. IWA Publishing 'Manual of Best Practice' Series, 2000. ISBN 1 900222 272
- Kunkel, G. et al, 2003. Water Loss Control Committee Report: Applying Worldwide Best Management Practices in Water Loss Control. Journal AWWA, 95:8:65
- AWWA Water Audits and Loss Control Programs, M36 Publication, 3rd Edition, 2009
- Service Connection Diagrams courtesy of Ronnie McKenzie, WRP Pty Ltd.

VERSION HISTORY: Table with 4 columns: Version, Release Date, Number of Worksheets, Key Features and Developments. Rows include v1 (2005/2006), v2 (2006), v3 (2007), v4-v4.2 (2010), and v5 (2014).

Appendix E

SBX7-7 Verification Forms

Appendix E: SBX7-7 Verification Form

SB X7-7 Table 0: Units of Measure Used in UWMP* (select one from the drop down list)

Acre Feet

*The unit of measure must be consistent with Table 2-3

NOTES:

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	17,063	Acre Feet
	2008 total volume of delivered recycled water	0	Acre Feet
	2008 recycled water as a percent of total deliveries	0%	Percent
	Number of years in baseline period ¹	10	Years
	Year beginning baseline period range	1999	
	Year ending baseline period range ²	2008	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range ³	2007	

¹ If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.

² The ending year must be between December 31, 2004 and December 31, 2010.

³ The ending year must be between December 31, 2007 and December 31, 2010.

NOTES:

SB X7-7 Table 2: Method for Population Estimates

Method Used to Determine Population (may check more than one)	
<input type="checkbox"/>	1. Department of Finance (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
<input type="checkbox"/>	2. Persons-per-Connection Method
<input checked="" type="checkbox"/>	3. DWR Population Tool
<input type="checkbox"/>	4. Other DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	1999	26,087
Year 2	2000	26,711
Year 3	2001	27,567
Year 4	2002	28,045
Year 5	2003	28,287
Year 6	2004	28,570
Year 7	2005	28,742
Year 8	2006	28,809
Year 9	2007	28,756
Year 10	2008	28,779
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	28,287
Year 2	2004	28,570
Year 3	2005	28,742
Year 4	2006	28,809
Year 5	2007	28,756
2015 Compliance Year Population		
	2015	29,452
NOTES:		

SB X7-7 Table 4: Annual Gross Water Use *

	Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Into Distribution System <i>Fm SB X7-7 Table(s) 4-A</i>	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water <i>Fm SB X7-7 Table 4-B</i>	Water Delivered for Agricultural Use	Process Water <i>Fm SB X7-7 Table(s) 4-D</i>	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1999	54,553	40,371	0	0	0	0	14,182
Year 2	2000	53,363	39,077	0	0	0	0	14,287
Year 3	2001	56,909	40,717	0	0	0	0	16,192
Year 4	2002	52,795	35,435	0	0	0	0	17,361
Year 5	2003	53,698	36,596	0	0	0	0	17,102
Year 6	2004	57,790	39,850	0	0	0	0	17,941
Year 7	2005	53,027	36,902	0	0	0	0	16,125
Year 8	2006	54,559	39,426	0	0	0	0	15,133
Year 9	2007	53,449	36,789	0	0	0	0	16,659
Year 10	2008	53,527	36,463	0	0	0	0	17,063
Year 11	0	0			0		0	0
Year 12	0	0			0		0	0
Year 13	0	0			0		0	0
Year 14	0	0			0		0	0
Year 15	0	0			0		0	0
10 - 15 year baseline average gross water use								16,204
5 Year Baseline - Gross Water Use								
Year 1	2003	53,698	36,596	0	0	0	0	17,102
Year 2	2004	57,790	39,850	0	0	0	0	17,941
Year 3	2005	53,027	36,902	0	0	0	0	16,125
Year 4	2006	54,559	39,426	0	0	0	0	15,133
Year 5	2007	53,449	36,789	0	0	0	0	16,659
5 year baseline average gross water use								16,592
2015 Compliance Year - Gross Water Use								
2015		31,238	21,571	0	0	0	0	9,666
* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3								
NOTES:								

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source		Placer County Water Agency		
This water source is:				
<input type="checkbox"/>	The supplier's own water source			
<input checked="" type="checkbox"/>	A purchased or imported source			
Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional (+/-)</i>	Corrected Volume Entering Distribution System	
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1999	10,489		10,489
Year 2	2000	10,698		10,698
Year 3	2001	12,709		12,709
Year 4	2002	14,007		14,007
Year 5	2003	18,196		18,196
Year 6	2004	16,101		16,101
Year 7	2005	15,470		15,470
Year 8	2006	11,095		11,095
Year 9	2007	12,446		12,446
Year 10	2008	12,794		12,794
Year 11	0			0
Year 12	0			0
Year 13	0			0
Year 14	0			0
Year 15	0			0
5 Year Baseline - Water into Distribution System				
Year 1	2003	18,196		18,196
Year 2	2004	16,101		16,101
Year 3	2005	15,470		15,470
Year 4	2006	11,095		11,095
Year 5	2007	12,446		12,446
2015 Compliance Year - Water into Distribution System				
2015		0		0
<i>* Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document</i>				
NOTES:				

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source Central Valley Project (Folsom Lake)

This water source is:

- The supplier's own water source
 A purchased or imported source

Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional</i> (+/-)	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System			
Year 1	1999	11,064.66	11,065
Year 2	2000	9,665.06	9,665
Year 3	2001	11,200.00	11,200
Year 4	2002	5,788.67	5,789
Year 5	2003	3,548.22	3,548
Year 6	2004	8,689.62	8,690
Year 7	2005	4,557.71	4,558
Year 8	2006	10,463.73	10,464
Year 9	2007	8,002.52	8,003
Year 10	2008	7,733.12	7,733
Year 11	0		0
Year 12	0		0
Year 13	0		0
Year 14	0		0
Year 15	0		0
5 Year Baseline - Water into Distribution System			
Year 1	2003	3,548.22	3,548
Year 2	2004	8,689.62	8,690
Year 3	2005	4,557.71	4,558
Year 4	2006	10,463.73	10,464
Year 5	2007	8,002.52	8,003
2015 Compliance Year - Water into Distribution System			
2015	0		0
<i>* Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document</i>			
NOTES:			

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source		Folsom Lake		
This water source is:				
<input checked="" type="checkbox"/>	The supplier's own water source			
<input type="checkbox"/>	A purchased or imported source			
Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional (+/-)</i>	Corrected Volume Entering Distribution System	
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1999	33,000.00		33,000
Year 2	2000	33,000.00		33,000
Year 3	2001	33,000.00		33,000
Year 4	2002	33,000.00		33,000
Year 5	2003	31,953.26		31,953
Year 6	2004	33,000.00		33,000
Year 7	2005	33,000.00		33,000
Year 8	2006	33,000.00		33,000
Year 9	2007	33,000.00		33,000
Year 10	2008	33,000.00		33,000
Year 11	0			0
Year 12	0			0
Year 13	0			0
Year 14	0			0
Year 15	0			0
5 Year Baseline - Water into Distribution System				
Year 1	2003	31,953.26		31,953
Year 2	2004	33,000.00		33,000
Year 3	2005	33,000.00		33,000
Year 4	2006	33,000.00		33,000
Year 5	2007	33,000.00		33,000
2015 Compliance Year - Water into Distribution System				
2015		31,238		31,238
* <i>Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document</i>				
NOTES:				

SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction (For use only by agencies that are deducting indirect recycled water)

Baseline Year <i>Fm SB X7-7 Table 3</i>	Surface Reservoir Augmentation					Groundwater Recharge			Total Deductible Volume of Indirect Recycled Water Entering the Distribution System	
	Volume Discharged from Reservoir for Distribution System Delivery	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission / Treatment Loss	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility*	Transmission / Treatment Losses	Recycled Volume Entering Distribution System from Groundwater Recharge		
10-15 Year Baseline - Indirect Recycled Water Use										
Year 1	1999		0		0			0	0	
Year 2	2000		0		0			0	0	
Year 3	2001		0		0			0	0	
Year 4	2002		0		0			0	0	
Year 5	2003		0		0			0	0	
Year 6	2004		0		0			0	0	
Year 7	2005		0		0			0	0	
Year 8	2006		0		0			0	0	
Year 9	2007		0		0			0	0	
Year 10	2008		0		0			0	0	
Year 11	0		0		0			0	0	
Year 12	0		0		0			0	0	
Year 13	0		0		0			0	0	
Year 14	0		0		0			0	0	
Year 15	0		0		0			0	0	
5 Year Baseline - Indirect Recycled Water Use										
Year 1	2003		0		0			0	0	
Year 2	2004		0		0			0	0	
Year 3	2005		0		0			0	0	
Year 4	2006		0		0			0	0	
Year 5	2007		0		0			0	0	
2015 Compliance - Indirect Recycled Water Use										
	2015		0		0			0	0	
*Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.										
NOTES: SJWD is not deducting indirect recycled water.										

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)

Baseline Year <i>Fm SB X7-7 Table 3</i>	Service Area Population <i>Fm SB X7-7 Table 3</i>	Annual Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD			
Year 1	1999	26,087	485
Year 2	2000	26,711	477
Year 3	2001	27,567	524
Year 4	2002	28,045	553
Year 5	2003	28,287	540
Year 6	2004	28,570	561
Year 7	2005	28,742	501
Year 8	2006	28,809	469
Year 9	2007	28,756	517
Year 10	2008	28,779	529
Year 11	0	0	
Year 12	0	0	
Year 13	0	0	
Year 14	0	0	
Year 15	0	0	
10-15 Year Average Baseline GPCD			516
5 Year Baseline GPCD			
Baseline Year <i>Fm SB X7-7 Table 3</i>	Service Area Population <i>Fm SB X7-7 Table 3</i>	Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use
Year 1	2003	28,287	540
Year 2	2004	28,570	561
Year 3	2005	28,742	501
Year 4	2006	28,809	469
Year 5	2007	28,756	517
5 Year Average Baseline GPCD			517
2015 Compliance Year GPCD			
2015	29,452	9,666	293

NOTES: Annual Gross Water Use in units of ac-ft/yr.

**SB X7-7 Table 6: Gallons per Capita per Day
Summary From Table SB X7-7 Table 5**

10-15 Year Baseline GPCD	516
5 Year Baseline GPCD	517
2015 Compliance Year GPCD	293
NOTES:	

SB X7-7 Table 7: 2020 Target Method

Select Only One

Target Method		Supporting Documentation
<input checked="" type="checkbox"/>	Method 1	SB X7-7 Table 7A
<input type="checkbox"/>	Method 2	SB X7-7 Tables 7B, 7C, and 7D <i>Contact DWR for these tables</i>
<input type="checkbox"/>	Method 3	SB X7-7 Table 7-E
<input type="checkbox"/>	Method 4	Method 4 Calculator

NOTES:

SB X7-7 Table 7-E: Target Method 3

Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
<input type="checkbox"/>		North Coast	137	130
<input type="checkbox"/>		North Lahontan	173	164
<input checked="" type="checkbox"/>	100%	Sacramento River	176	167
<input type="checkbox"/>		San Francisco Bay	131	124
<input type="checkbox"/>		San Joaquin River	174	165
<input type="checkbox"/>		Central Coast	123	117
<input type="checkbox"/>		Tulare Lake	188	179
<input type="checkbox"/>		South Lahontan	170	162
<input type="checkbox"/>		South Coast	149	142
<input type="checkbox"/>		Colorado River	211	200
Target <i>(If more than one region is selected, this value is calculated.)</i>				167

NOTES:

SB X7-7 Table 7-A: Target Method 1
20% Reduction

10-15 Year Baseline GPCD	2020 Target GPCD
516	413
NOTES:	

SB X7-7 Table 7-E: Target Method 3

Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
<input type="checkbox"/>		North Coast	137	130
<input type="checkbox"/>		North Lahontan	173	164
<input checked="" type="checkbox"/>	100%	Sacramento River	176	167
<input type="checkbox"/>		San Francisco Bay	131	124
<input type="checkbox"/>		San Joaquin River	174	165
<input type="checkbox"/>		Central Coast	123	117
<input type="checkbox"/>		Tulare Lake	188	179
<input type="checkbox"/>		South Lahontan	170	162
<input type="checkbox"/>		South Coast	149	142
<input type="checkbox"/>		Colorado River	211	200
Target <i>(If more than one region is selected, this value is calculated.)</i>				167
NOTES:				

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target

5 Year Baseline GPCD <i>From SB X7-7 Table 5</i>	Maximum 2020 Target*	Calculated 2020 Target <i>Fm Appropriate Target Table</i>	Confirmed 2020 Target
517	492	413	413
* Maximum 2020 Target is 95% of the 5 Year Baseline GPCD			
NOTES: All values in units of GPCD.			

SB X7-7 Table 8: 2015 Interim Target GPCD

Confirmed 2020 Target <i>Fm SB X7-7 Table 7-F</i>	10-15 year Baseline GPCD <i>Fm SB X7-7 Table 5</i>	2015 Interim Target GPCD
413	516	464
NOTES:		

SB X7-7 Table 9: 2015 Compliance

Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments <i>(in GPCD)</i>		2015 GPCD <i>(Adjusted if applicable)</i>	Did Supplier Achieve Targeted Reduction for 2015?
		TOTAL Adjustments	Adjusted 2015 GPCD		
293	464	0	293	293	YES
NOTES:					

Appendix F

DWR Online Population Tool Results

Please print this page to a PDF and include as part of your UWMP submittal.

Confirmation Information			
Generated By	Water Supplier Name	Confirmation #	Generated On
Jennifer Lau	San Juan Water District	1944104850	4/5/2016 11:27:49 AM

Boundary Information		
Census Year	Boundary Filename	Internal Boundary ID
1990	No Boundary Selected	N/A
2000	No Boundary Selected	N/A
2010	SJWD-District-Boundary.kml	560
1990	No Boundary Selected	N/A
2000	No Boundary Selected	N/A
2010	SJWD-District-Boundary.kml	560
1990	No Boundary Selected	N/A
2000	No Boundary Selected	N/A
2010	SJWD-District-Boundary.kml	560

Baseline Period Ranges

10 to 15-year baseline period

Number of years in baseline period:

Year beginning baseline period range:

Year ending baseline period range¹: 2008

5-year baseline period

Year beginning baseline period range:

Year ending baseline period range²: 2007

¹ The ending year must be between December 31, 2004 and December 31, 2010.

² The ending year must be between December 31, 2007 and December 31, 2010.

Persons per Connection			
Year	Census Block Level	Number of Connections *	Persons per Connection
	Total Population		
1990	0	<input type="text"/>	2.91
1991	-	-	2.91
1992	-	-	2.91
1993	-	-	2.91
1994	-	-	2.91
1995	-	-	2.91
1996	-	-	2.91
1997	-	-	2.91
1998	-	-	2.91
1999	-	-	2.91
2000	0	<input type="text"/>	2.91
2001	-	-	2.91
2002	-	-	2.91
2003	-	-	2.91
2004	-	-	2.91
2005	-	-	2.91
2006	-	-	2.91
2007	-	-	2.91
2008	-	-	2.91
2009	-	-	2.91
2010	28,826	<input type="text" value="9893"/>	2.91
2015	-	-	2.91 **

Population Using Persons-Per-Connection				
Year		Number of Connections *	Persons per Connection	Total Population
10 to 15 Year Baseline Population Calculations				
Year 1	1999	8953	2.91	26,087
Year 2	2000		2.91	
Year 3	2001	9461	2.91	27,567
Year 4	2002	9625	2.91	28,045
Year 5	2003	9708	2.91	28,287
Year 6	2004	9805	2.91	28,570
Year 7	2005	9864	2.91	28,742
Year 8	2006	9887	2.91	28,809
Year 9	2007	9869	2.91	28,756
Year 10	2008	9877	2.91	28,779
5 Year Baseline Population Calculations				
Year 1	2003	9708	2.91	28,287
Year 2	2004	9805	2.91	28,570
Year 3	2005	9864	2.91	28,742
Year 4	2006	9887	2.91	28,809
Year 5	2007	9869	2.91	28,756
2015 Compliance Year Population Calculations				
	2015	10108	2.91 **	29,452

Hide Print Confirmation

QUESTIONS / ISSUES? CONTACT THE WUEdata HELP DESK

Appendix G

SJWD's Water Shortage Contingency Plan and SJWD's Surface Water
Supply and Water Shortage Plan

San Juan Shortage Agreement

San Juan Surface Water Supply & Shortage Plan

I. Recitals

- A. San Juan is the owner of certain surface water rights and contractual water entitlements, and facilities and entitlements for the diversion, treatment and conveyance of water from Folsom Reservoir, to make available treated water supplies within its wholesale and retail service area that benefit all members of the San Juan Family of Agencies (Member Agencies).
- B. All San Juan Member Agencies are bound by the Water Forum Agreement to specified reductions in the amount of surface water that can be diverted from the American River during specified hydrologic events.
- C. To manage water demands in excess of available surface water supplies, for any reason, it is the intent of the Member Agencies that these shortages conditions be addressed by using groundwater.
- D. Citrus Heights Water District, Fair Oaks Water District, and Orange Vale Water Company are the owners of groundwater production facilities.
- E. Solutions to address reductions in surface water diversions by using groundwater have been developed to the mutual benefit and interest of all Member Agencies.
- F. Water supply shortage solutions will be consistent with the terms of each Agency's Water Forum purveyor-specific agreement, and will not adversely impact implementation of the Water Forum's lower American River flow management plan.
- G. The water supply shortage solutions will be implemented in a manner that protects the water supply and financial interests of affected ratepayers, including their investment in existing facilities.
- H. Those Member Agencies that are beneficiaries of a solution will pay for the full benefit received.
- I. San Juan will be the manager of the Shortage program and in that role will contract for groundwater and be the accountant for groundwater usage and costs.
- J. The Family members agree as follows:
 - 1. Definitions. When used in this Plan:
 - A. "Benefitting Agencies" means those Member Agencies that receive additional allotments of surface water during a shortage year by virtue of other Member Agencies using groundwater.
 - B. "Capital Costs" are defined as those costs for new groundwater production facilities.
 - C. "Commodity Costs" are those costs directly associated with the operation of groundwater facilities for the production of groundwater during a water shortage.
 - D. "Groundwater Suppliers" means those Member Agencies that have available groundwater in excess of their own needs under all but emergency shortage conditions.

San Juan Shortage Agreement

- E. "Emergency Shortages," means those shortages in surface water deliveries resulting from actions other than a Water Forum based cutback in diversions, and could include no surface water deliveries.
- F. "Groundwater Production Facilities" means wells, pumps, piping, electrical controls and other physical components that are necessary for the production and distribution of groundwater.
- G. "Level of Service" means the amount of water available to retail customers when compared to historical demands during normal water years.
- H. "Member Agencies" means the following retail water service providers receiving wholesale water service from San Juan, and the retail water service customers of San Juan: (1) Citrus Heights Water District; (2) Fair Oaks Water District; (3) Orange Vale Water Company; (4) San Juan in its capacity as a retail water service provider; and (5) the City of Folsom.
- I. "Operational and Maintenance Costs" are defined as costs (labor, parts, supplies, etc.) for routine maintenance of the groundwater production facilities necessary to insure that when groundwater is needed, the production capacity will be there.
- J. "Period of Shortage" means the years, or periods of time, when surface water availability to the Member Agencies is reduced, and groundwater is used to supplement the available surface water supply to meet the desired level of service.
- K. "San Juan" means the San Juan Water District.
- L. "San Juan's Water Treatment and Conveyance Facilities" means the water diversion, pumping, treatment and conveyance facilities that are used by San Juan to make surface water available to the Member Agencies.
- M. "Water Forum Agreement" refers to the Memorandum of Understanding dated January 2000, among the various signatories that has seven complimentary actions, one of which is the Groundwater Management Element.
- N. "Water Forum Shortages" shall mean those reductions in surface water as specified in the Water Forum Agreement.

II. Surface Water Supply Shortage

- A. San Juan will be responsible for monitoring the Unimpaired Inflow into Folsom Reservoir as provided for in the Water Forum Agreement, and will keep the Member Agencies apprised of the projected water availability for the water year.
- B. Surface water availability will be in accordance with the conditions of the Water Forum Agreement or USBR reductions of contract water supplies, shortage will be declared by San Juan in consultation with the Member Agencies.

San Juan Shortage Agreement

- C. Reductions in surface water deliveries in accordance with the Water Forum Agreement or USBR reductions of contract water supplies will only be made after other remedies for additional surface water have been exhausted.
- D. San Juan in consultation with other Member Agencies will determine the amount of groundwater that must be supplied to achieve the agreed upon level of service for each Member Agency.
- E. Operation of Groundwater facilities and surface water system shall be coordinated by San Juan. San Juan shall be responsible for notifying the Groundwater Suppliers of their obligations for the water year.
- F. Groundwater facilities are the property of the appropriate Member Agencies and will only be operated by that Family member.
- G. Member Agencies that do not have access to groundwater will receive surface water in an amount necessary to meet the service level determined by the Member Agencies.
- H. Non-emergency or shortage condition reductions in surface water deliveries by San Juan or U.S. Bureau of Reclamation for maintenance shall only be made subsequent to an announcement by either of planned maintenance activities.

IV. Availability of Groundwater Facilities

- A. Citrus Heights Water District, Fair Oaks Water District and Orange Vale Water Company shall independently determine how much groundwater they have available for sale to other family members assuming Dry Year conditions under the Water Forum.
- B. San Juan shall contract with each Member Agency for the amount of groundwater they have determined that is surplus to their Water Forum needs and is needed by San Juan for its wholesale obligations.
- C. In consultation with all Member Agencies, after a shortage is declared, San Juan shall determine how much groundwater is needed to meet its wholesale obligations under Dry Year conditions and will designate how much Groundwater each Groundwater Provider must provide.

III. Operation & Maintenance of Groundwater Facilities

- A. Each Groundwater supplier shall maintain their facilities in accordance with the agreed upon maintenance schedule presented in Appendix A.
- B. Annually, each Groundwater supplier shall submit a summary of Operation and Maintenance work performed to San Juan. In addition, the Groundwater supplier shall submit an updated 5 year CIP list for Groundwater facilities that have been contracted for by San Juan.

San Juan Shortage Agreement

IV. **Wholesale Rates and Charges**

- A. Rates and charges shall consist of three components: (1) capital costs for new or replacement elements; (2) operation and maintenance costs; and, (3) commodity costs. *Groundwater suppliers shall develop and submit cost estimates for each component to the Member Agencies for review and concurrence. San Juan shall include these costs in the next Wholesale Water Rate Study. **This element needs some thought with regard to how it is developed and how is it updated. Having the rate consultant review the costs would provide for a defensible position on making sure that no one benefits at the expense of another party. The costs should not include capital costs. See C below.***
- B. Each Groundwater Supplier will submit San Juan a bill for operation and maintenance, and commodity costs on a quarterly basis. San Juan will prorate the billing and bill the appropriate Member Agencies for their fair share. ***Do we want to follow the same format as Wholesale charges, ie bill in the future and correct?***
- C. Capital costs for new or replacement groundwater infrastructure shall be developed by the Groundwater supplier and submitted to the benefitting groundwater users for *review, evaluation, and agreement*. Payment by each benefitting party for their share of capital costs shall be made to the Member Agency responsible for the project. ***Thought here is that how the benefitting party pays for the improvement is an internal affair.***

V. **General Provisions**

- A. **Periodic Review; Amendment.** San Juan and the Member Agencies will meet not less than once every year to review the maintenance plan, and maintenance activities performed to date. Amendments to this Shortage Plan must be approved by all Member Agencies.

WATER CONSERVATION STAGE DECLARATION

Upon declaration or amendment by the Board of Directors of a specific Stage in effect as defined in Section I, the following mandatory water conservation requirements shall be in effect.

The declaration of Short-Term Stage 4 or Stage 5 water conservation requirements may be declared by the agency's General Manager or his/her designee and subject to ratification by the agency's Board of Directors in a regular or special session. A short-term declaration is for water shortage conditions expected for a duration of 45 days or less.

STAGE 1 – NORMAL WATER SUPPLY

- 1 Water shall be used for beneficial purposes only; all unnecessary and wasteful uses of water are prohibited.
- 2 Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining properties or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
- 3 Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.
- 4 Leaking customer pipes or faulty sprinklers shall be repaired within five (5) working days or less if warranted by the severity of the problem.
- 5 All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations.
- 6 Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health, esthetic or sanitary purposes, is prohibited.
- 7 Customers are encouraged to take advantage of the water agency's conservation programs and rebates.

STAGE 2 – WATER ALERT

1. Water shall be used for beneficial purposes only; all unnecessary and wasteful uses of water are prohibited.
2. Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining properties or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
3. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.
4. Leaking customer pipes or faulty sprinklers shall be repaired within five (5) working days or less if warranted by the severity of the problem.
5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations.
6. Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health, esthetic or sanitary purposes, is prohibited.
7. Customers are encouraged to take advantage of the water agency's conservation programs and rebates.
8. Reduce landscape and pasture irrigation by 5 – 10%. Customers with "smart" irrigation timers or controllers are asked to set their controllers to achieve 90 to 95% of the evapotranspiration (ET) rate. Drip irrigation systems are excluded from this requirement.
9. Reduce indoor water use by 5 – 10%. Contact your water provider for tips and techniques to reduce indoor water use.
10. Users of construction meters and fire hydrant meters will be monitored for efficient water use.

3 – WATER WARNING

1. Water shall be used for beneficial purposes only; all unnecessary and wasteful uses of water are prohibited.
2. Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining properties or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
3. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.
4. Leaking customer pipes or faulty sprinklers shall be repaired within two (2) working days or less if warranted by the severity of the problem.
5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations.
6. Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health, esthetic or sanitary purposes, is prohibited.
7. Customers are encouraged to take advantage of the water agency's conservation programs and rebates.
8. Reduce landscape and pasture irrigation by 11 – 25%. Customers with "smart" irrigation timers or controllers are asked to set their controllers to achieve 75 to 89% of the evapotranspiration (ET) rate. Drip irrigation systems are excluded from this requirement.
9. Reduce indoor water use by 11 – 25%. Contact your water provider for tips and techniques to reduce indoor water use.
10. Restaurants shall serve water only upon request.
11. Users of construction meters and fire hydrant meters will be monitored for efficient water use.

STAGE 4 – WATER CRISIS: SHORT-TERM

The declaration of Short-Term Stage 4 water conservation requirements may be declared by the agency's General Manager or his/her designee and subject to ratification by the agency's Board of Directors in a regular or special session. A short-term declaration is for water shortage conditions expected for a duration of 45 days or less.

1. Water shall be used for beneficial purposes only; all unnecessary and wasteful uses of water are prohibited.
2. Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining properties or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
3. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.
4. Leaking customer pipes or faulty sprinklers shall be repaired within 24 hours or less if warranted by the severity of the problem.
5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. No potable water from the District's system shall be used to fill or refill swimming pools, artificial lakes, ponds or streams. Water use for ornamental ponds and fountains is prohibited.
6. Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health or sanitary purposes, is prohibited.
7. Customers are encouraged to take advantage of the water agency's conservation programs and rebates.
8. Reduce landscape and pasture irrigation by 26 – 50%. Customers with "smart" irrigation timers or controllers are asked to set their controllers to achieve 50 to 74% of the evapotranspiration (ET) rate. Drip irrigation systems are NOT excluded from this requirement.
9. Reduce indoor water use by 26 -50%. Contact your water provider for tips and techniques to reduce indoor water use.
10. Restaurants shall serve water only upon request.
11. Flushing of sewers or fire hydrants is prohibited except in case of emergency and for essential operations.
12. Users of construction meters and fire hydrant meters will be monitored for efficient water use. Use of reclaimed water for construction purposes is encouraged.
13. Installation of new turf or landscaping is prohibited.
14. Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.

STAGE 4 – WATER CRISIS: LONG-TERM

The declaration of Long-Term Stage 4 water conservation requirements will be by the agency's Board of Directors in a regular or special session. A long-term declaration is for water shortage conditions expected for a duration of more than 45 days.

1. Water shall be used for beneficial purposes only; all unnecessary and wasteful uses of water are prohibited.
2. Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining properties or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
3. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.
4. Leaking customer pipes or faulty sprinklers shall be repaired within 24 hours or less if warranted by the severity of the problem.
5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. No potable water from the District's system shall be used to fill or refill swimming pools, artificial lakes, ponds or streams. Water use for ornamental ponds and fountains is prohibited.
6. Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health or sanitary purposes, is prohibited.
7. Customers are encouraged to take advantage of the water agency's conservation programs and rebates.
8. Reduce landscape and pasture irrigation by 26 – 50%. Customers with "smart" irrigation timers or controllers are asked to set their controllers to achieve 50 to 74% of the evapotranspiration (ET) rate. Drip irrigation systems are NOT excluded from this requirement.
9. Reduce indoor water use by 26 -50%. Contact your water provider for tips and techniques to reduce indoor water use.
10. Restaurants shall serve water only upon request.
11. Flushing of sewers or fire hydrants is prohibited except in case of emergency and for essential operations.
12. Water for flow testing and construction purposes from water agency fire hydrants and blow-offs is prohibited. Use of reclaimed water for construction purposes is encouraged.
13. Installation of new turf or landscaping is prohibited.
14. Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.
15. Water Crisis/Emergency tiered pricing will be implemented.
16. No commitments will be made to provide service for new water service connections.

STAGE 5 – WATER EMERGENCY: SHORT-TERM

The declaration of Short-Term Stage 5 water conservation requirements may be declared by the agency's General Manager or his/her designee and subject to ratification by the agency's Board of Directors in a regular or special session. A short-term declaration is for water shortage conditions expected for a duration of 45 days or less.

1. Water shall be used for beneficial purposes only; all unnecessary and wasteful uses of water are prohibited.
2. Landscape and pasture irrigation is prohibited.
3. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.
4. Leaking customer pipes or faulty sprinklers shall be repaired immediately. Water service will be suspended until repairs are made.
5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. No potable water from the District's system shall be used to fill or refill swimming pools, artificial lakes, ponds or streams. Water use for ornamental ponds and fountains is prohibited.
6. Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health or sanitary purposes, is prohibited.
7. Customers are encouraged to take advantage of the water agency's conservation programs and rebates.
8. Reduce indoor water use by more than 50%. Contact your water provider for tips and techniques to reduce indoor water use.
9. Restaurants shall serve water only upon request.
10. Water for flow testing and construction purposes from water agency fire hydrants and blow-offs is prohibited. No potable water from the District's system shall be used for construction purposes including but not limited to dust control, compaction, or trench jetting. Use of reclaimed water for construction purposes is encouraged.
11. Flushing of sewers or fire hydrants is prohibited except in case of emergency and for essential operations.
12. Installation of new turf or landscaping is prohibited.
13. Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.

STAGE 5 – WATER EMERGENCY: LONG-TERM

The declaration of Long-Term Stage 5 water conservation requirements will be by the agency's Board of Directors in a regular or special session. A long-term declaration is for water shortage conditions expected for a duration of more than 45 days.

1. Water shall be used for beneficial purposes only; all unnecessary and wasteful uses of water are prohibited.
2. Landscape and pasture irrigation is prohibited.
3. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.
4. Leaking customer pipes shall be repaired immediately. Water service will be suspended until repairs are made.
5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. No potable water from the District's system shall be used to fill or refill swimming pools, artificial lakes, ponds or streams. Water use for commercial and multi-family residential ornamental ponds and fountains is prohibited.
6. Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health or sanitary purposes, is prohibited.
7. Customers are encouraged to take advantage of the water agency's conservation programs and rebates.
8. Reduce indoor water use by more than 50%.
9. Restaurants shall serve water only upon request.
10. Water for flow testing and construction purposes from water agency fire hydrants and blow-offs is prohibited. No potable water from the District's system shall be used for construction purposes including but not limited to dust control, compaction, or trench jetting. Use of reclaimed water for construction purposes is encouraged.
11. Flushing of sewers or fire hydrants is prohibited except in case of emergency and for essential operations.
12. Installation of new turf or landscaping is prohibited.
13. Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.
14. New connections to the District water distribution system will not be allowed.
15. Water Crisis/Emergency tiered pricing will be implemented.
16. No commitments will be made to provide service for new water service connections.

Appendix H

CUWCC Annual Reports



Base Year Data

Agency name: **San Juan Water District**

Reporting unit number:

Reporting unit name : **San Juan Water District - Wholesale**

2007

Base Year

BMP 1.3 Metering

Number of unmetered accounts in Base Year

BMP 3.1 & BMP 3.2 & BMP 3.3 Residential Programs

Number of Single Family Customers and Multy Family Customers in Base Year

BMP 3.4 WaterSense Specification (WSS) Toilets

Number of Single Family Units and Number of Multi Family Units prior to 1992

Average number of toilets per Single Family household and Multi Family households

Five year average resale rate of Single Family households and Multi Family households

Average number of persons per Single Family households and Multi Family households

BMP 4.0 & BMP 5.0 CII & Landscape

Total water use (in Acre Feet) by CII accounts

Number of accounts with dedicated irrigation meters

Number of CII accounts without meters or with Mixed Use Meters

Number of CII accounts

Comments

Methodology

Average number of persons per single family household 2.90

Average number of persons per multi family household 19.0 x 4 multifamily



BMP1.1 Operation Practices - Wholesale Only 2011

Reporting unit name (District name)

San Juan Water District - Wholesale

Reporting unit number:

2007

Contact Information

First Name:

Vicki

Title:

Water Resources Analyst

Phone:

916-791-6933

Last Name:

Sacksteder

Email:

vsacksteder@sjwd.org

Wholesale Agency assistance programs

a) Financial Investments and Building Partnerships

BMP Section	Monetary Amount for Financial Incentives	Monetary Amount for Equivalent Resource
BMP 2.1 Public Outreach	0	6585
BMP 2.2 School Education Program	0	6585

b) Technical Support

Interfacing with USBR staff - SJWD-W Retail Customer Agencies (CVP subcontractors) for water conservation reporting & practices; coordination on the UWMP for DWR; and Public Education & Outreach are a major emphasis of RWA & CUWCC advocacy efforts.

c) Retail Agency

d) Water Shortage Allocation

6/28/2006

The District has the following stages and corresponding reductions in place to occur during water shortage conditions. Stage Reduction amount: 1. Normal Water Supply 0%; 2. Water Alert 5 to 10%; 3. Water Warning 11 to 25%; 4. Water Crisis 26 to 50%.

11000 Prohibited Practices Prohibited Practices and Enforcement Measures.pdf

e) Non-Signatory Reporting

N/A

f) Encourage CUWCC Membership

All of San Juan Water District-Wholesale's retail customer agencies are CUWCC MOU signatories.

0.00

At Least As effective As

No

Exemption

No

Comments:



BMP1.1 Operation Practices - Wholesale Only 2012

Reporting unit name (District name)

San Juan Water District - Wholesale

Reporting unit number:

2007

Contact Information

First Name:

Vicki

Title:

Water Resources Analyst

Phone:

916-791-6933

Last Name:

Sacksteder

Email:

vsacksteder@sjwd.org

Wholesale Agency assistance programs

a) Financial Investments and Building Partnerships

BMP Section	Monetary Amount for Financial Incentives	Monetary Amount for Equivalent Resource
BMP 2.1 Public Outreach	0	6585
BMP 2.2 School Education Program	0	6585

b) Technical Support

Interfacing with USBR staff - SJWD-W Retail Customer Agencies (CVP subcontractors) for water conservation reporting & practices; coordination on the UWMP for DWR; and Public Education & Outreach are a major emphasis of RWA & CUWCC advocacy efforts.

c) Retail Agency

d) Water Shortage Allocation

6/28/2006

The District's stages and corresponding reductions occur during water shortage conditions. Water Stages: 1. Normal Water Supply 0%; 2. Water Alert 5 to 10%; 3. Water Warning 11 to 25%; 4. Water Crisis 26 to 50%; 5. Water Emergency Greater than 50%.

Copy of 11000 Prohibited Practices Prohibited Practices and Enforcement Measures.pdf

e) Non-Signatory Reporting

f) Encourage CUWCC Membership

San Juan Water District has reached out to potential Group 1 and Group 2 members and discussed the benefits of joining the California Urban Water Conservation Council.

0.00

At Least As effective As

No

Exemption

No

Comments:



BMP1.1 Operation Practices - Wholesale Only 2013

Reporting unit name (District name)

San Juan Water District - Wholesale

Reporting unit number:

2007

Contact Information

First Name:

Vicki

Title:

Water Resources Analyst

Phone:

916-791-6933

Last Name:

Sacksteder

Email:

vsacksteder@sjwd.org

Wholesale Agency assistance programs

a) Financial Investments and Building Partnerships

BMP Section	Monetary Amount for Financial Incentives	Monetary Amount for Equivalent Resource
BMP 2.2 School Education Program	0	6585
BMP 2.1 Public Outreach	0	6585

b) Technical Support

Quarterly meetings of the Regional Water Authority - Water Efficiency Program with all San Juan retail agencies where professional development and technical support are shared.

c) Retail Agency

d) Water Shortage Allocation

6/28/2006

The District has the following stages and corresponding reductions in place to occur during water shortage conditions. Stage Reduction amount: 1. Normal Water Supply 0%; 2. Water Alert 5 to 10%; 3. Water Warning 11 to 25%; 4. Water Crisis 26 to 50%.

Copy1 of 11000 Prohibited Practices Prohibited Practices and Enforcement Measures.pdf

e) Non-Signatory Reporting

f) Encourage CUWCC Membership

San Juan Water District has reached out to potential Group 1 and Group 2 members and discussed the benefits of joining the California Urban Water Conservation Council.

At Least As effective As

No

Exemption

No

Comments:



BMP 1.2 Water Loss Control 2011

Reporting unit name

Reporting unit number:

San Juan Water District - Wholesale

2007

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software

Yes

Uploaded filename:

Copy_of_2011_Completed_AWWA_Water_Loss_Control_Reporting_Worksheet.xls

Water Audit Validity Score from AWWA spreadsheet:

93

Agency Completed Training In The AWWA Water Audit Method

Yes

Agency Completed Training In The Component Analysis Process

Yes

Completed/Updated the Component Analysis (at least every 4 years)?

No

Component Analysis Completed/Updated Date

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective

Yes

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported

No

Leak Location

Yes

Type of Leaking Pipe Segment or Fitting

Yes

Leak Running Time From Report to Repair

Yes

Leak Volume Estimate

Yes

Cost of Repair

Yes

Do you have an infrastructure rehabilitation and renewal program ?

Yes

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective

Yes

Type of Program Activities Used to Detect Unreported Leaks

Does your agency maintain in-house records of audit results or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC?

Yes

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances?

No

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Please describe your infrastructure rehabilitation and renewal activity below

AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:

2.68

Real Losses per service connection per day:

97.62

Real Losses per length of main per day:

N/A

Real Losses per service connection per day per psi pressure:

1.95



BMP 1.2 Water Loss Control 2011

Unavoidable Annual Real Losses(UARL): 174.82

Above, Real Losses=Current Annual Real Losses(CARL): 1141.81

Infrastructure Leakage Index (ILI) [CARL/UARL]: 6.53

At Least As effective As

Exemption

Comments:



BMP 1.2 Water Loss Control 2012

Reporting unit name

Reporting unit number:

San Juan Water District - Wholesale

2007

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software

Yes

Uploaded filename:

2012 Completed AWWA Water Loss Control Reporting Worksheet.xls

Water Audit Validity Score from AWWA spreadsheet:

93

Agency Completed Training In The AWWA Water Audit Method

Yes

Agency Completed Training In The Component Analysis Process

Yes

Completed/Updated the Component Analysis (at least every 4 years)?

No

Component Analysis Completed/Updated Date

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective

Yes

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported

Yes

Leak Location

Yes

Type of Leaking Pipe Segment or Fitting

Yes

Leak Running Time From Report to Repair

Yes

Leak Volume Estimate

Yes

Cost of Repair

Yes

Do you have an infrastructure rehabilitation and renewal program ?

Yes

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective

Yes

Type of Program Activities Used to Detect Unreported Leaks

Does your agency maintain in-house records of audit results or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC?

Yes

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances?

No

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Please describe your infrastructure rehabilitation and renewal activity below

AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:

2.98

Real Losses per service connection per day:

103.32

Real Losses per length of main per day:

N/A

Real Losses per service connection per day per psi pressure:

2.07



BMP 1.2 Water Loss Control 2012

Unavoidable Annual Real Losses(UARL): 174.82

Above, Real Losses=Current Annual Real Losses(CARL): 1208.51

Infrastructure Leakage Index (ILI) [CARL/UARL]: 6.91

At Least As effective As

Exemption

Comments:



BMP 1.2 Water Loss Control 2013

Reporting unit name

Reporting unit number:

San Juan Water District - Wholesale

2007

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software

Yes

Uploaded filename:

Copy_of_2013_AWWA_Water_Loss_Control_Reporting_Worksheet.xls

Water Audit Validity Score from AWWA spreadsheet:

93

Agency Completed Training In The AWWA Water Audit Method

Yes

Agency Completed Training In The Component Analysis Process

Yes

Completed/Updated the Component Analysis (at least every 4 years)?

No

Component Analysis Completed/Updated Date

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective

Yes

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported

Yes

Leak Location

Yes

Type of Leaking Pipe Segment or Fitting

Yes

Leak Running Time From Report to Repair

Yes

Leak Volume Estimate

Yes

Cost of Repair

Yes

Do you have an infrastructure rehabilitation and renewal program ?

Yes

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective

Yes

Type of Program Activities Used to Detect Unreported Leaks

Does your agency maintain in-house records of audit results or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC?

Yes

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances?

No

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Please describe your infrastructure rehabilitation and renewal activity below

AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:

3.17

Real Losses per service connection per day:

91.83

Real Losses per length of main per day:

N/A

Real Losses per service connection per day per psi pressure:

1.84



BMP 1.2 Water Loss Control 2013

Unavoidable Annual Real Losses(UARL): 175.61

Above, Real Losses=Current Annual Real Losses(CARL): 1081.63

Infrastructure Leakage Index (ILI) [CARL/UARL]: 6.16

At Least As effective As

Exemption

Comments:



BMP 1.3 Metering With Commodity 2011

Reporting unit name: Reporting unit number:

Implementation

Does your agency have any unmetered service connections?

If YES, has your agency completed a meter retrofit plan?

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered?

Are all new service connections being billed volumetrically?

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?

Meters Matrix

Account Type	Num Of Metered Accounts	Num Of Metered Accounts Read	Num Of Metered Accounts Billed By Volume	Billing Frequency	Estimated Bills Per Year	Meter Readings Per Year
Other	5	5	5	Annually	1	12

Number of CII Accounts with Mixed-use Meters

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?

If YES, please fill in the following information:

A. When was the Feasibility Study conducted

Describe, upload or provide an electronic link to the Feasibility Study Upload File

At Least As effective As

Exemption

Comments:



BMP 1.3 Metering With Commodity 2012

Reporting unit name: Reporting unit number:

Implementation

Does your agency have any unmetered service connections?

If YES, has your agency completed a meter retrofit plan?

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered?

Are all new service connections being billed volumetrically?

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?

Meters Matrix

Account Type	Num Of Metered Accounts	Num Of Metered Accounts Read	Num Of Metered Accounts Billed By Volume	Billing Frequency	Estimated Bills Per Year	Meter Readings Per Year
Other	5	5	5	Annually	1	12

Number of CII Accounts with Mixed-use Meters:

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period:

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?

If YES, please fill in the following information:

A. When was the Feasibility Study conducted

Describe, upload or provide an electronic link to the Feasibility Study Upload File

At Least As effective As

Exemption

Comments:



BMP 1.3 Metering With Commodity 2013

Reporting unit name: Reporting unit number:

Implementation

Does your agency have any unmetered service connections?

If YES, has your agency completed a meter retrofit plan?

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered?

Are all new service connections being billed volumetrically?

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?

Meters Matrix

Account Type	Num Of Metered Accounts	Num Of Metered Accounts Read	Num Of Metered Accounts Billed By Volume	Billing Frequency	Estimated Bills Per Year	Meter Readings Per Year
Other	4	4	4	Annually	1	12

Number of CII Accounts with Mixed-use Meters:

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period:

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?

If YES, please fill in the following information:

A. When was the Feasibility Study conducted

Describe, upload or provide an electronic link to the Feasibility Study Upload File

At Least As effective As

Exemption

Comments:



BMP 2.1 Public Outreach

2011

Reporting unit name

Reporting unit #

/

Does your agency perform Public Outreach programs?

The list of retail agencies your agency assists with public outreach

Please provide the name of Agency if not CUWCC Group1 members

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year?

Number of Public Contacts	Public Information Programs Name
4	General water conservation information

Contact with the Media

The list of retail agencies your agency assists with public outreach

Please provide the name of Agency if not CUWCC Group1 members

Did at least one contact take place during each quarter of the reporting year?

Number of Media Contacts	Public Outreach Media Contact Name List
5	News releases
7	Articles or stories resulting from outreach
8	Newspaper contacts

Wholesale Agency Website Updates

The list of retail agencies your agency assists with public outreach

Please provide the name of Agency if not CUWCC Group1 members

Agency Website Updates



BMP 2.1 Public Outreach

2011

Enter your agency's URL (website address):

www.sjwd.org

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

SJWD Wholesale provides timely and comprehensive water efficiency, conservation and rebate information as well as drought updates on our website including the Blue Thumb Campaign, Save Our Water, and 20x2020. We offer WEL Garden tours and on Fridays.

Did at least one Website Update take place during each quarter of the reporting year?

Yes

Public Information Programs Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or break the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Annual Budget Category	Annual Budget Amount	Personal Cost Included?	Comments
Public Information	6585	V	RWA

Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Public Outreach Expense Category	Expense Amount	Personal Cost Included?
Public Information	6585	V

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important / effective listed first (where 1 = most important).

Were there additional Public Outreach efforts?

Yes

Public Outreach Additional Information

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot?

Yes

Describe the brand, theme or mascot.

We share the "Blue Thumb" branding theme with the Regional Water Authority.

Market Research

Have you sponsored or participated in market research to refine your message?

Yes

Market Research Topic

Target Market Research

Brand Message

Water Efficiency

Brand Mission Statement

Water Efficiency

Community Committees

Do you have a community conservation committee?

Yes

Enter the names of the community committees:

Conservation Committee - SJWD Board Sub-Subcommittee

Training

Social Marketing Expenditures



BMP 2.1 Public Outreach

2011

Public Outreach Social Marketing Expenses

Partnering Programs

Name	Type of Program
<input type="checkbox"/> CLCA?	
<input type="checkbox"/> Green Building Programs?	
<input type="checkbox"/> Master Gardeners?	Master Gardener on Conservation Staff
<input type="checkbox"/> Cooperative Extension?	
<input type="checkbox"/> Local Colleges?	
<input checked="" type="checkbox"/> Other	Green Gardener Program

Retail and wholesale outlet; name(s) and type(s) of programs:

Blue Thumb Promotion

Partnering Programs - Newsletters

Number of newsletters per year

Number of customers per year

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

SMUD and PG&E partner with San Juan Water District and our retail customer agencies in providing water efficiency rebates that is overseen by the Regional Water Authority.

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new homes

The WEL Garden demonstrates efficient irrigation and non-water using materials with ground covers, gazebos, fire-resistant and deer-resistant plants, and an oak tree-compatible gardens containing native plants and grasses.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

The RWA "Blue Thumb" gardener contest that served as a successful promotional program.

Additional Programs supported by Agency but not mentioned above:

The River-Friendly Landscaping Green Gardener Professional Training Program is an approach to landscaping that works with nature to reduce waste, prevent pollution and support the integrity of the Sacramento River watershed.

At Least As effective As



BMP 2.1 Public Outreach

2011

Exemption

No

0

Comments

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BMP 2.1 Public Outreach

2012

Reporting unit name

Reporting unit #

/

Does your agency perform Public Outreach programs?

The list of retail agencies your agency assists with public outreach

Please provide the name of Agency if not CUWCC Group1 members

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year?

Number of Public Contacts	Public Information Programs Name
4	Landscape water conservation media campaigns

Contact with the Media

The list of retail agencies your agency assists with public outreach

Please provide the name of Agency if not CUWCC Group1 members

Did at least one contact take place during each quarter of the reporting year?

Number of Media Contacts	Public Outreach Media Contact Name List
5	News releases
6	Newspaper contacts
4	Articles or stories resulting from outreach
4	Radio contacts

Wholesale Agency Website Updates

The list of retail agencies your agency assists with public outreach



BMP 2.1 Public Outreach

2012

Please provide the name of Agency if not CUWCC Group1 members

Agency Website Updates

Enter your agency's URL (website address):

Describe a minimum of four water conservationrelated updates to your agency's website thattook place during the year:

SJWD Wholesale provides timely and comprehensive water efficiency, conservation and rebate information as well as information about the Blue Thumb Campaign, Save Our Water, and 20x2020. Tours of SJWD's Treatment Plant and WEL Garden are also offered.

Did at least one Website Update take place duringeach quarter of the reporting year?

Public Information Programs Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or brake the budget into discretecategories by entering many rows. Please indicate if personnel costs are included in the entry.

Annual Budget Category	Annual Budget Amount	Personal Cost Included?	Comments
Public Info	6585	V	RWA Programs

Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question relatedto your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Public Outreach Expense Category	Expense Amount	Personal Cost Included?
Public Information	6585	V

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of howyour agency views their importance / effectiveness with respect to conserving water, with the mostimportant/ effective listed first (where 1 = most important).

Were there additional Public Outreach efforts?

Public Outreach Additional Information

Social Marketing Programs

Branding Does your agency have a water conservation"brand," "theme" or mascot?

Describe the brand, theme or mascot.

Market Research Have you sponsored or participated inmarket research to refine your message?

Market Research Topic

Brand Message

Brand Mission Statement

Community Committees

Do you have a community conservation committee?

Enter the names of the community committees:



BMP 2.1 Public Outreach

2012

Training

Training Type	Number of Trainings	Number of Attendees	Description of Other
4	12	25	RWA Meeting

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Partnering Programs

Name	Type of Program
<input type="checkbox"/> CLCA?	Green Gardener through RWA
<input type="checkbox"/> Green Building Programs?	Green Gardener through RWA
<input type="checkbox"/> Master Gardeners?	
<input type="checkbox"/> Cooperative Extension?	
<input type="checkbox"/> Local Colleges?	
<input checked="" type="checkbox"/> Other	
<input checked="" type="checkbox"/> Retail and wholesale outlet; name(s) and type(s) of programs:	
WEL Garden Landcape Workshops/Classes	

Partnering Programs - Newsletters

Number of newsletters per year Number of customers per year

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new homes

To provide year-round examples of water and energy-efficient gardening methods, San Juan has developed a water-efficient landscape demonstration garden -- the Water Efficient Landscape (WEL) Garden. On Friday afternoon tours are offered by staff.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

Blue Thumb Contests

Additional Programs supported by Agency but not mentioned above:

At Least As effective As

Exemption

Comments



BMP 2.1 Public Outreach

2013

Reporting unit name

Reporting unit #

/

Does your agency perform Public Outreach programs?

The list of retail agencies your agency assists with public outreach

Please provide the name of Agency if not CUWCC Group1 members

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year?

Number of Public Contacts	Public Information Programs Name
4	General water conservation information

Contact with the Media

The list of retail agencies your agency assists with public outreach

Please provide the name of Agency if not CUWCC Group1 members

Did at least one contact take place during each quarter of the reporting year?

Number of Media Contacts	Public Outreach Media Contact Name List
4	News releases

Wholesale Agency Website Updates

The list of retail agencies your agency assists with public outreach

Please provide the name of Agency if not CUWCC Group1 members

Agency Website Updates

Enter your agency's URL (website address):

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

Did at least one Website Update take place during each quarter of the reporting year?



BMP 2.1 Public Outreach

2013

Public Information Programs Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or break the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Annual Budget Category	Annual Budget Amount	Personal Cost Included?	Comments
Public Information	6585		Regional Water Authority

Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Public Outreach Expense Category	Expense Amount	Personal Cost Included?
Public Information	6585	

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important / effective listed first (where 1 = most important).

Were there additional Public Outreach efforts?

Public Outreach Additional Information

Public Information Additional Programs	Importance
Regional Water Authority	2

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot?

Describe the brand, theme or mascot.

Market Research

Have you sponsored or participated in market research to refine your message?

Market Research Topic

Brand Message

Brand Mission Statement

Community Committees

Do you have a community conservation committee?

Enter the names of the community committees:

Training



BMP 2.1 Public Outreach

2013

Training Type	Number of Trainings	Number of Attendees	Description of Other
4	12	25	RWA Technical Meetings

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
Public Outreach	6585	Combined RWA Budget

Partnering Programs

- | Name | Type of Program |
|---|---|
| <input type="checkbox"/> CLCA? | |
| <input type="checkbox"/> Green Building Programs? | |
| <input type="checkbox"/> Master Gardeners? | |
| <input type="checkbox"/> Cooperative Extension? | |
| <input type="checkbox"/> Local Colleges? | |
| <input type="checkbox"/> Other | |
| <input type="checkbox"/> | Retail and wholesale outlet; name(s) and type(s) of programs: |

Partnering Programs - Newsletters

Number of newsletters per year Number of customers per year

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new homes

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

Additional Programs supported by Agency but not mentioned above:

At Least As effective As

Exemption



BMP 2.1 Public Outreach

2013

Comments



BMP 2.2 School Education Programs 2011

Reporting unit name Reporting unit #
 /

Does your agency perform Public Outreach programs? No

The list of retail agencies your agency assists with school education programs

Please provide the name of Agency if not CUWCC Group1 members

Materials meet state education framework requirements? Description

Materials distributed to K-6 Students? Description

Number of students reached

Materials distributed to 7-12 Students? (optional) Description

Annual budget for school education program

Description of all other water supplier education programs

School Programs Activities

Classroom Presentation:

Number of presentation Number of attendees

Describe the topics covered in your classroom presentations:

Large group assemblies:

Number of presentation Number of attendees

Children's water festivals or other events:

Number of presentation Number of attendees

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentation Number of attendees

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description Number distributed

Staffing children's booths at events & festivals:

Number of booths Number of attendees

Water conservation contests such as poster and photo:

Description Number of participants



BMP 2.2 School Education Programs 2011

Offer monetary awards/funding or scholarships to students:

Number offered

Total funding

Teacher training workshops:

Number of presentation

Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or fieldtrips

Number of participants

College internships in water conservation offered:

Number of internship

Total funding

Career Fairs / Workshops:

Number of presentation

Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description	Number of events	Number of participants
<input type="text"/>	<input type="text"/>	<input type="text"/>

Comments

At Least As effective As

Exemption



BMP 2.2 School Education Programs 2012

Reporting unit name Reporting unit #
 /

Does your agency perform Public Outreach programs? Yes

The list of retail agencies your agency assists with school education programs

Please provide the name of Agency if not CUWCC Group1 members

<input checked="" type="checkbox"/>	Materials meet state education framework requirements?	Description	<input type="text" value="The Be Water Smart News teaches kids to practice water efficiency in every-day activities and meets state education framework requirements."/>
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<input checked="" type="checkbox"/>	Materials distributed to K-6 Students?	Description	<input type="text" value="The Be Water Smart News teaches kids to practice water efficiency in every-day activities and meets state education framework requirements."/>
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Number of students reached

<input checked="" type="checkbox"/>	Materials distributed to 7-12 Students? (optional)	Description	<input type="text" value="Student newspaper supplement- Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee and colorful 'California Waterways Map' provided by the California Department of Water Resources."/>
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Annual budget for school education program

Description of all other water supplier education programs	<input type="text" value="Student newspaper supplement- Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee and colorful 'California Waterways Map' provided by the California Department of Water Resources."/>
--	--

School Programs Activities

Classroom Presentation:

Number of presentation	<input type="text"/>	Number of attendees	<input type="text"/>
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Describe the topics covered in your classroom presentations:

Large group assemblies:

Number of presentation	<input type="text"/>	Number of attendees	<input type="text"/>
------------------------	----------------------	---------------------	----------------------

Children's water festivals or other events:

Number of presentation	<input type="text"/>	Number of attendees	<input type="text"/>
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Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentation	<input type="text"/>	Number of attendees	<input type="text"/>
------------------------	----------------------	---------------------	----------------------

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description	<input type="text"/>	Number distributed	<input type="text"/>
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Staffing children's booths at events & festivals:

Number of booths	<input type="text"/>	Number of attendees	<input type="text"/>
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Water conservation contests such as poster and photo:



BMP 2.2 School Education Programs 2012

Description

Number of participants

Offer monetary awards/funding or scholarships to students:

Number offered

Total funding

Teacher training workshops:

Number of presentation

Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or fieldtrips

Number of participants

College internships in water conservation offered:

Number of internship

Total funding

Career Fairs / Workshops:

Number of presentation

Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description

Number of events

Number of participants

Comments

At Least As effective As

Exemption



BMP 2.2 School Education Programs 2013

Reporting unit name Reporting unit #
 /

Does your agency perform Public Outreach programs? Yes

The list of retail agencies your agency assists with school education programs

Please provide the name of Agency if not CUWCC Group1 members

Materials meet state education framework requirements? Description

Materials distributed to K-6 Students? Description

Number of students reached

Materials distributed to 7-12 Students? (optional) Description

Annual budget for school education program

Description of all other water supplier education programs

School Programs Activities

Classroom Presentation:
Number of presentation Number of attendees

Describe the topics covered in your classroom presentations:

Large group assemblies:
Number of presentation Number of attendees

Children's water festivals or other events:
Number of presentation Number of attendees

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:
Number of presentation Number of attendees

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):
Description Number distributed

Staffing children's booths at events & festivals:
Number of booths Number of attendees

Water conservation contests such as poster and photo:
Description Number of participants



BMP 2.2 School Education Programs 2013

Offer monetary awards/funding or scholarships to students:

Number offered

Total funding

Teacher training workshops:

Number of presentation

Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or fieldtrips

Number of participants

College internships in water conservation offered:

Number of internship

Total funding

Career Fairs / Workshops:

Number of presentation

Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description

Number of events

Number of participants

Comments

At Least As effective As

Exemption



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2011 Non Potable Water Sources

Service Area Population: 309927

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed	56229.74	Surface	Folsom Lake
	56229.74		



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2012 Non Potable Water Sources

Service Area Population: 309927

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed	49766.14	Surface	Folsom Lake
	49766.14		



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2013 Non Potable Water Sources

Service Area Population: 138398

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed	48268.38	Surface	Folsom Lake
	48268.38		



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2011 Potable Water Sources

Service Area Population:

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed	56229.74	Surface	Folsom Lake
	56229.74		



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2013 Potable Water Sources

Service Area Population:

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed		Surface	Folsom Lake



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2011 Non Potable Water Uses

Billed:

CustomerType	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered Accounts	Un-Metered Water Delivered AF/Year	Description
Other	1	18.79	0	0.00	Roseville Interties
Other	1	187.90	0	0.00	Granite Bay Golf Course
	2	206.69	0	0.00	

Un-Billed:



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2012 Non Potable Water Uses

Billed:

CustomerType	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered Accounts	Un-Metered Water Delivered AF/Year	Description
Other	1	243.21	0	0.00	Granite Bay Golf Course
Other	1	339.75	0	0.00	Roseville Interties
	2	582.96	0	0.00	

Un-Billed:



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2013 Non Potable Water Uses

Billed:

CustomerType	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered Accounts	Un-Metered Water Delivered AF/Year	Description
Other	1	382.62	0	0.00	Granite Bay Golf Course
	1	382.62	0	0.00	

Un-Billed:



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2011 Potable Water Uses

Billed:

CustomerType	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered Accounts	Un-Metered Water Delivered AF/Year	Description
Other	1	12508.48	0	0.00	San Juan Water District Retail
Other	1	1292.93	0	0.00	City of Folsom ARC
Other	1	12292.03	0	0.00	Citrus Heights Water District
Other	1	9596.77	0	0.00	Fair Oaks Water District
Other	1	4108.37	0	0.00	Orange Vale Water Company
Other	1	14727.78	0	0.00	Sacramento Suburban Water District
	6	54526.36	0	0.00	

Un-Billed:



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2012 Potable Water Uses

Billed:

CustomerType	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered Accounts	Un-Metered Water Delivered AF/Year	Description
Other	1	2995.29			Sacramento Suburban Water District
Other	1	1528.89			City of Folsom - ARC
Other	1	13935.85			San Juan Water District-Retail
Other	1	4657.45			Orange Vale Water Company
Other	1	9987.44			Fair Oaks Water District
Other	1	13583.04			Citrus Heights Water Distric
	6	46687.96			

Un-Billed:



Reporting Unit Name
San Juan Water District - Wholesale
Wholesale Only

Reporting Unit ID#:
2007

2013 Potable Water Uses

Billed:

CustomerType	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered Accounts	Un-Metered Water Delivered AF/Year	Description
Other	1	14944.85	0	0.00	San Juan Water District - Retail
Other	1	1426.09	0	0.00	City of Folsom - ARC
Other	1	14416.21	0	0.00	Citrus Heights Water District
Other	1	10939.23	0	0.00	Fair Oaks Water District
Other	1	5138.61	0	0.00	Orange Vale Water Company
	5	46864.99	0	0.00	

Un-Billed:



CUWCC BMP Wholesale Coverage Report 2011

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Wholesale Agency Assistance Programs

ON TRACK

2007 San Juan Water District - Wholesale

Name: Vicki Sacksteder Email: vsacksteder@sjwd.org

a) Financial Investments and Building Partnerships

BMP Section	Monetary Amount for Financial Incentives	Monetary Amount for Equivalent Resources
BMP 2.1 Public Outreach	0	6585
BMP 2.2 School Education Program	0	6585

b) Technical Support

c) Retail Agency

d) Water Shortage Allocation

Adoption Date: 6/28/2006

File Name: The District has the following stages and corresponding reductions in place to occur during water shortage conditions. Stage Reduction amount: 1. Normal Water Supply 0%; 2. Water Alert 5 to 10%; 3. Water Warning 11 to 25%; 4. Water Crisis 26 to 50%.

e) Non signatory Reporting of BMP implementation by non-signatory Agencies

N/A

f) Encourage CUWCC Membership List Efforts to Recruit Retailers

All of San Juan Water District-Wholesale's retail customer agencies are CUWCC MOU signatories.

0.00

At Least As effective As

No

Exemption

No

Comments:



CUWCC BMP Wholesale Coverage Report 2012

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Wholesale Agency Assistance Programs

ON TRACK

2007 San Juan Water District - Wholesale

Name: Vicki Sacksteder Email: vsacksteder@sjwd.org

a) Financial Investments and Building Partnerships

BMP Section	Monetary Amount for Financial Incentives	Monetary Amount for Equivalent Resources
BMP 2.1 Public Outreach	0	6585
BMP 2.2 School Education Program	0	6585

b) Technical Support

c) Retail Agency

d) Water Shortage Allocation

Adoption Date: 6/28/2006

File Name: The District's stages and corresponding reductions occur during water shortage conditions. Water Stages: 1. Normal Water Supply 0%; 2. Water Alert 5 to 10%; 3. Water Warning 11 to 25%; 4. Water Crisis 26 to 50%; 5. Water Emergency Greater than 50%.

e) Non signatory Reporting of BMP implementation by non-signatory Agencies

f) Encourage CUWCC Membership List Efforts to Recruit Retailers

San Juan Water District has reached out to potential Group 1 and Group 2 members and discussed the benefits of joining the California Urban Water Conservation Council.

0.00

At Least As effective As

No

Exemption

No

Comments:



CUWCC BMP Wholesale Coverage Report 2013

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Wholesale Agency Assistance Programs

ON TRACK

2007 San Juan Water District - Wholesale

Name: Vicki Sacksteder Email: vsacksteder@sjwd.org

a) Financial Investments and Building Partnerships

BMP Section	Monetary Amount for Financial Incentives	Monetary Amount for Equivalent Resources	
BMP 2.2 School Education Program	0	6585	
BMP 2.1 Public Outreach	0	6585	

b) Technical Support

c) Retail Agency

d) Water Shortage Allocation

Adoption Date: 6/28/2006

File Name: The District has the following stages and corresponding reductions in place to occur during water shortage conditions. Stage Reduction amount: 1. Normal Water Supply 0%; 2. Water Alert 5 to 10%; 3. Water Warning 11 to 25%; 4. Water Crisis 26 to 50%.

e) Non signatory Reporting of BMP implementation by non-signatory Agencies

f) Encourage CUWCC Membership List Efforts to Recruit Retailers

San Juan Water District has reached out to potential Group 1 and Group 2 members and discussed the benefits of joining the California Urban Water Conservation Council.

At Least As effective As

No

Exemption

No

Comments:



CUWCC BMP Wholesale Coverage Report 2014

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Wholesale Agency Assistance Programs

ON TRACK

2007 San Juan Water District - Wholesale

Name: Lisa Brown Email: lbrown@sjwd.org

a) Financial Investments and Building Partnerships

BMP Section	Monetary Amount for Financial Incentives	Monetary Amount for Equivalent Resources	
BMP 3 Residential	0	350	
BMP 2.2 School Education Program	0	700	

b) Technical Support

c) Retail Agency

d) Water Shortage Allocation

Adoption Date: 8/1/2008

File Name:

e) Non signatory Reporting of BMP implementation by non-signatory Agencies

f) Encourage CUWCC Membership List Efforts to Recruit Retailers

All San Juan Wholesale agencies are members of the CUWCC. This includes San Juan-Retail, Orange vale Water District, City of Folsom, Fair Oaks Water District and Citrus Heights Water District.

0.00

At Least As effective As

No

Exemption

No

Comments:

District should be on track with compliance. However, database reflects off track performance.



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

2007 San Juan Water District - Wholesale

Completed Standard Water Audit Using AWWA Software? Yes

AWWA File provided to CUWCC? Yes

Copy_of_2011_Completed_AWWA_Water_Loss_Control_Reporting_Worksheet.xls

AWWA Water Audit Validity Score? 93

Complete Training in AWWA Audit Method Yes

Complete Training in Component Analysis Process? Yes

Component Analysis? No

Repaired all leaks and breaks to the extent cost effective? Yes

Locate and Repair unreported leaks to the extent cost effective? Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

2007 San Juan Water District - Wholesale

Completed Standard Water Audit Using AWWA Software? Yes

AWWA File provided to CUWCC? Yes

2012 Completed AWWA Water Loss Control Reporting Worksheet.xls

AWWA Water Audit Validity Score? 93

Complete Training in AWWA Audit Method Yes

Complete Training in Component Analysis Process? Yes

Component Analysis? No

Repaired all leaks and breaks to the extent cost effective? Yes

Locate and Repair unreported leaks to the extent cost effective? Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

On Track

2007 San Juan Water District - Wholesale

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
Copy_of_2013_AWWA_Water_Loss_Control_Reporting_Worksheet.xls	
AWWA Water Audit Validity Score?	93
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	No
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repair unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

2007 San Juan Water District - Wholesale

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
Wholesale 2014 AWWA Water Loss Report.xls	
AWWA Water Audit Validity Score?	82
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	Yes
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repair unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
0	32361	102442	0	True		

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

2007 San Juan Water District - Wholesale

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	0
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	No
Feasibility Study provided to CUWCC?	No
Date: 1/1/0001	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

2007 San Juan Water District - Wholesale

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	No
Feasibility Study provided to CUWCC?	No
Date: 1/1/0001	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

2007 San Juan Water District - Wholesale

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	No
Feasibility Study provided to CUWCC?	No
Date: 1/1/0001	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

2007 San Juan Water District - Wholesale

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	No
Feasibility Study provided to CUWCC?	No
Date:	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

2007 San Juan Water District - Wholesale

Wholesale

Does your agency perform Public Outreach programs? Yes

The list of retail agencies your agency assists with public outreach

Citrus Heights WD, City of Folsom, Fair Oaks Water District, Orangevale Water Co., San Juan Water District - Retail

The name of agency, contact name and email address if not CUWCC Group 1 members

Home Depot

Did at least one contact take place during each quarter of the reporting year? No

Public Outreach Program List	Number
General water conservation information	4
Total	4

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
News releases	5
Articles or stories resulting from outreach	7
Newspaper contacts	8
Total	20

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Information	6585
Total Amount:	6585

Description of all other Public Outreach programs

Blue Thumb Promotion Green Gardner Program

Comments:

At Least As effective As

Exemption



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

2007 San Juan Water District - Wholesale

Wholesale

Does your agency perform Public Outreach programs? Yes

The list of retail agencies your agency assists with public outreach

Citrus Heights WD, City of Folsom, Fair Oaks Water District, Orangevale Water Co., San Juan Water District - Retail

The name of agency, contact name and email address if not CUWCC Group 1 members

San Juan Water District Retail Customer Agencies

Did at least one contact take place during each quarter of the reporting year? No

Public Outreach Program List	Number
Landscape water conservation media campaigns	4
Total	4

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
News releases	5
Newspaper contacts	6
Articles or stories resulting from outreach	4
Radio contacts	4
Total	19

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Info	6585
Total Amount:	6585

Description of all other Public Outreach programs

WEL Garden Landcape Workshops/Classes

Comments:

At Least As effective As

Exemption



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

2007 San Juan Water District - Wholesale Wholesale

Does your agency perform Public Outreach programs? Yes

The list of retail agencies your agency assists with public outreach

City of Folsom, Fair Oaks Water District, Orangevale Water Co., San Juan Water District - Retail

The name of agency, contact name and email address if not CUWCC Group 1 members

Did at least one contact take place during each quarter of the reporting year? No

Public Outreach Program List	Number
General water conservation information	4
Total	4

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
News releases	4
Total	4

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Information	6585
Total Amount:	6585

Public Outreach Additional Programs

Regional Water Authority

Description of all other Public Outreach programs

Comments:

At Least As effective As

Exemption



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

2007 San Juan Water District - Wholesale

Wholesale

Does your agency perform Public Outreach programs? Yes

The list of retail agencies your agency assists with public outreach

Citrus Heights WD, City of Folsom, Fair Oaks Water District, Orangevale Water Co., San Juan Water District - Retail

Agency Name	ID number
Citrus Heights WD	5998
City of Folsom	6978
Fair Oaks Water District	120
Orangevale Water Co.	6006
San Juan Water District - Retail	199

The name of agency, contact name and email address if not CUWCC Group 1 members

Did at least one contact take place during each quarter of the reporting year? Yes

Public Outreach Program List	Number
Website	12
Newsletter articles on conservation	6
Total	18

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
Online Advertisings	9
Total	9

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
outreach budget	74610
Total Amount:	74610

Public Outreah Additional Programs

Regional Water Authority

Description of all other Public Outreach programs

Comments:



BMP 2.1 Public Outreach

ON TRACK

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At Least As effective As

No

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Exemption

No

0



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

2007 San Juan Water District - Wholesale

Wholesale

Does your agency implement School Education programs? No

The list of retail agencies your agency assists with public outreach

Citrus Heights WD, City of Folsom, Fair Oaks Water District, Orangevale Water Co., San Juan Water District - Retail

Materials meet state education framework requirements? Yes

The Be Water Smart News teaches kids to practice water efficiency in every-day activities and meets state education framework requirements.

Materials distributed to K-6? Yes

Student newspaper supplement/Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee to (K-12) past participants of the Media in Education Program & to teachers that have subscribed for this particular water supplement

Materials distributed to 7-12 students? Yes (Info Only)

Student newspaper supplement- Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee and colorful "California Waterways Map" provided by the California Department of Water Resources.

Annual budget for school education program: 6585.00

Description of all other water supplier education programs

Project WET (Water Education for Teachers) workshops for K-12 educators.

Comments:

At Least As effective As No

Exemption No 0



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

2007 San Juan Water District - Wholesale

Wholesale

Does your agency implement School Education programs? Yes

The list of retail agencies your agency assists with public outreach

Citrus Heights WD, City of Folsom, Fair Oaks Water District, Orangevale Water Co., San Juan Water District - Retail

The Be Water Smart News teaches kids to practice water efficiency in every-day activities and meets state education framework requirements.

Materials meet state education framework requirements? Yes

The Be Water Smart News teaches kids to practice water efficiency in every-day activities and meets state education framework requirements.

Materials distributed to K-6? Yes

The Be Water Smart News teaches kids to practice water efficiency in every-day activities and meets state education framework requirements.

Materials distributed to 7-12 students? Yes (Info Only)

Student newspaper supplement- Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee and colorful "California Waterways Map" provided by the California Department of Water Resources.

Annual budget for school education program: 6585.00

Description of all other water supplier education programs

Student newspaper supplement- Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee and colorful "California Waterways Map" provided by the California Department of Water Resources.

Comments:

At Least As effective As No

Exemption No 0



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

2007 San Juan Water District - Wholesale

Wholesale

Does your agency implement School Education programs? Yes

The list of retail agencies your agency assists with public outreach

Citrus Heights WD, City of Folsom, Fair Oaks Water District, Orangevale Water Co., San Juan Water District - Retail

Materials meet state education framework requirements? Yes

The Be Water Smart News teaches kids to practice water efficiency in every-day activities and meets state education framework requirements.

Materials distributed to K-6? Yes

Student newspaper supplement/Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee to (K-12) past participants of the Media in Education Program & to teachers that have subscribed for this particular water supplement

Materials distributed to 7-12 students? Yes (Info Only)

Student newspaper supplement- Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee and colorful "California Waterways Map" provided by the California Department of Water Resources.

Annual budget for school education program: 6585.00

Description of all other water supplier education programs
Water Efficiency Workshops at WEL Garden

Comments:

At Least As effective As No

Exemption No 0



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

2007 San Juan Water District - Wholesale

Wholesale

Does your agency implement School Education programs? No

The list of retail agencies your agency assists with public outreach

Citrus Heights WD, City of Folsom, Fair Oaks Water District, Orangevale Water Co., San Juan Water District - Retail

Regional Water Authority, Amy Talbot, atalbot@rwah2o.org

Agencies Name	ID number
Citrus Heights WD	5998
City of Folsom	6978
Fair Oaks Water District	120
Orangevale Water Co.	6006
San Juan Water District - Retail	199

Materials meet state education framework requirements? Yes

Water Smart News teacher's guide provides lessons based on California state standards.

Materials distributed to K-6? Yes

Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee to K-12 graders. A CA Waterways Map provided from DWR is distributed to 4-8 graders. Living Rivers of the Sac Valley is distributed to 9-12 graders.

Materials distributed to 7-12 students? Yes (Info Only)

Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee to K-12 graders. A CA Waterways Map provided from DWR is distributed to 4-8 graders. Living Rivers of the Sac Valley is distributed to 9-12 graders.

Annual budget for school education program: 31000.00

Description of all other water supplier education programs

The District coordinates a water conservation poster contest open to 4-6 graders. The Sacramento Bee's Media in Education program supports the WaterSpots video contest on water conservation themes.

Comments:

At Least As effective As No

Exemption No 0



Base Year Data

Agency name: **San Juan Water District**

Reporting unit number:

Reporting unit name : **San Juan Water District - Retail**

199

Base Year

BMP 1.3 Metering

Number of unmetered accounts in Base Year

BMP 3.1 & BMP 3.2 & BMP 3.3 Residential Programs

Number of Single Family Customers and Multy Family Customers in Base Year

BMP 3.4 WaterSense Specification (WSS) Toilets

Number of Single Family Units and Number of Multi Family Units prior to 1992

Average number of toilets per Single Family household and Multi Family households

Five year average resale rate of Single Family households and Multi Family households

Average number of persons per Single Family households and Multi Family households

BMP 4.0 & BMP 5.0 CII & Landscape

Total water use (in Acre Feet) by CII accounts

Number of accounts with dedicated irrigation meters

Number of CII accounts without meters or with Mixed Use Meters

Number of CII accounts

Comments



BMP1.1 Operation Practices - Retail Only 2011

Reporting unit name (District name)

San Juan Water District - Retail

Reporting unit number:

199

Conservation Coordinator: Yes

Contact Information

First Name:

Last Name:

Title:

Phone:

Email:

Water Waste Prevention

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.	San Juan Water District Retail BMP 1-1 2009 11000 Prohibited Practices.pdf		San Juan Water District Code of Ordinances contains two water waste ordinances. Prohibited Practices include 11000.01 Leaks or Wasteful Use of Water and 23000.04 Penalties for Water Waste under Any Conservation Stage amended August 1, 2008.
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			N/A
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			N/A
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			N/A
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			N/A
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			N/A



BMP1.1 Operation Practices - Retail Only 2011

At Least As effective As

N/A

Exemption

No

Comments:

N/A



BMP1.1 Operation Practices - Retail Only 2012

Reporting unit name (District name)

San Juan Water District - Retail

Reporting unit number:

199

Conservation Coordinator: Yes

Contact Information

First Name:

Last Name:

Title:

Phone:

Email:

Water Waste Prevention

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.	San Juan Water District Water Waste Preventions Ordinances.pdf		San Juan Water District Code of Ordinances contains two water waste ordinances. Prohibited Practices include 11000.01 Leaks or Wasteful Use of Water and 23000.04 Penalties for Water Waste under Any Conservation Stage amended August 1, 2008.
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			N/A
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			N/A
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			N/A
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			N/A
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			N/A



BMP1.1 Operation Practices - Retail Only 2012

At Least As effective As

N/A

Exemption

No

Comments:

N/A



BMP1.1 Operation Practices - Retail Only 2013

Reporting unit name (District name)

San Juan Water District - Retail

Reporting unit number:

199

Conservation Coordinator: Yes

Contact Information

First Name:

Last Name:

Title:

Phone:

Email:

Water Waste Prevention

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.	Copy2 of 11000 Prohibited Practices Prohibited Practices and Enforcement Measures.pdf		San Juan Water District Code of Ordinances contains two water waste ordinances. Prohibited Practices include 11000.01 Leaks or Wasteful Use of Water and 23000.04 Penalties for Water Waste under Any Conservation Stage amended August 1, 2008.
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			



BMP1.1 Operation Practices - Retail Only 2013

At Least As effective As

Exemption

Comments:



BMP 1.2 Water Loss Control 2011

Reporting unit name

Reporting unit number:

San Juan Water District - Retail

199

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software

Yes

Uploaded filename:

2011 Completed AWWA Water Loss Control Reporting Worksheet.xls

Water Audit Validity Score from AWWA spreadsheet:

93

Agency Completed Training In The AWWA Water Audit Method

Yes

Agency Completed Training In The Component Analysis Process

Yes

Completed/Updated the Component Analysis (at least every 4 years)?

No

Component Analysis Completed/Updated Date

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective

Yes

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported

Yes

Leak Location

Yes

Type of Leaking Pipe Segment or Fitting

Yes

Leak Running Time From Report to Repair

Yes

Leak Volume Estimate

Yes

Cost of Repair

Yes

Do you have an infrastructure rehabilitation and renewal program ?

Yes

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective

Yes

Type of Program Activities Used to Detect Unreported Leaks

The District contracts with an electronic leak detection service to survey large sections of the service area. Leaks are also detected/ reported by our field crews, customers, meter reader and other utilities and public works departments.

Does your agency maintain in-house records of audit results or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC?

Yes

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances?

Yes

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Please describe your infrastructure rehabilitation and renewal activity below

Additionally, in 2009, new magnetic flow meters were installed throughout the wholesale system at a cost of \$4.7 million. The system is now in place to conduct a complete water loss audit for both the retail and wholesale systems.

AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:

2.68

Real Losses per service connection per day:

97.62



BMP 1.2 Water Loss Control 2011

Real Losses per length of main per day:	N/A
Real Losses per service connection per day per psi pressure:	1.95
Unavoidable Annual Real Losses(UARL):	174.82
Above, Real Losses=Current Annual Real Losses(CARL):	1141.81
Infrastructure Leakage Index (ILI) [CARL/UARL]:	6.53

At Least As effective As

Exemption

Comments:



BMP 1.2 Water Loss Control 2012

Reporting unit name: Reporting unit number:

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software

Uploaded filename:

Water Audit Validity Score from AWWA spreadsheet:

Agency Completed Training In The AWWA Water Audit Method

Agency Completed Training In The Component Analysis Process

Completed/Updated the Component Analysis (at least every 4 years)?

Component Analysis Completed/Updated Date

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported	<input type="text" value="Yes"/>	Leak Location	<input type="text" value="Yes"/>
Type of Leaking Pipe Segment or Fitting	<input type="text" value="Yes"/>	Leak Running Time From Report to Repair	<input type="text" value="Yes"/>
Leak Volume Estimate	<input type="text" value="Yes"/>	Cost of Repair	<input type="text" value="Yes"/>
Do you have an infrastructure rehabilitation and renewal program ?			<input type="text" value="Yes"/>

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective

Type of Program Activities Used to Detect Unreported Leaks

Does your agency maintain in-house records of audit results or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC?

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances?

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Tota Leaks Repaired	Economic Val Of Real Loss	Economic Val Of App Loss	Miles Of System Surveyed For Leaks	Pressure Red Undertkn For Loss Reduction	Cost Of Interventions	Water Saved
80			1.5	No		71.2

Please describe your infrastructure rehabilitation and renewal activity below

AWWA Model



BMP 1.2 Water Loss Control 2012

Operational Efficiency Indicator

Apparent Losses per service connection per day:	2.98
Real Losses per service connection per day:	103.32
Real Losses per length of main per day:	N/A
Real Losses per service connection per day per psi pressure:	2.07
Unavoidable Annual Real Losses(UARL):	174.82
Above, Real Losses=Current Annual Real Losses(CARL):	1208.51
Infrastructure Leakage Index (ILI) [CARL/UARL]:	6.91

At Least As effective As

Exemption

Comments:



BMP 1.2 Water Loss Control 2013

Reporting unit name

Reporting unit number:

San Juan Water District - Retail

199

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software

Yes

Uploaded filename:

2013 AWWA Water Loss Control Reporting Worksheet.xls

Water Audit Validity Score from AWWA spreadsheet:

93

Agency Completed Training In The AWWA Water Audit Method

Yes

Agency Completed Training In The Component Analysis Process

Yes

Completed/Updated the Component Analysis (at least every 4 years)?

Yes

Component Analysis Completed/Updated Date

8/1/2014

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective

Yes

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported

Yes

Leak Location

Yes

Type of Leaking Pipe Segment or Fitting

Yes

Leak Running Time From Report to Repair

Yes

Leak Volume Estimate

Yes

Cost of Repair

Yes

Do you have an infrastructure rehabilitation and renewal program ?

Yes

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective

Yes

Type of Program Activities Used to Detect Unreported Leaks

The District contracts with an electronic leak detection service to survey large sections of the service area. Leaks are also detected/ reported by our field crews, customers, meter reader and other utilities and public works departments.

Does your agency maintain in-house records of audit results or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC?

Yes

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances?

No

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Please describe your infrastructure rehabilitation and renewal activity below

AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:

3.17

Real Losses per service connection per day:

91.83



BMP 1.2 Water Loss Control 2013

Real Losses per length of main per day:	N/A
Real Losses per service connection per day per psi pressure:	1.84
Unavoidable Annual Real Losses(UARL):	175.61
Above, Real Losses=Current Annual Real Losses(CARL):	1081.63
Infrastructure Leakage Index (ILI) [CARL/UARL]:	6.16

At Least As effective As

Exemption

Comments:



BMP 1.3 Metering With Commodity 2011

Reporting unit name: Reporting unit number:

Implementation

Does your agency have any unmetered service connections?

If YES, has your agency completed a meter retrofit plan?

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered?

Are all new service connections being billed volumetrically?

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?

Meters Matrix

Account Type	Num Of Metered Accounts	Num Of Metered Accounts Read	Num Of Metered Accounts Billed By Volume	Billing Frequency	Estimated Bills Per Year	Meter Readings Per Year
Single-Family	9791	9791	9791	Bi-monthly	6	6
Multi-Family	120	120	120	Bi-monthly	6	6
Commercial	238	238	238	Bi-monthly	6	6
Institutional	11	11	11	Bi-monthly	6	6
Dedicated Irrigation	207	207	207	Bi-monthly	6	6
Agricultural	4	4	4	Bi-monthly	6	6
Other	8	8	8	Bi-monthly	6	6

Number of CII Accounts with Mixed-use Meters: Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period:

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?

If YES, please fill in the following information:
 A. When was the Feasibility Study conducted

Describe, upload or provide an electronic link to the Feasibility Study Upload File



BMP 1.3 Metering With Commodity 2011

At Least As effective As

Exemption

Comments:



BMP 1.3 Metering With Commodity 2012

Reporting unit name: Reporting unit number:

Implementation

Does your agency have any unmetered service connections?

If YES, has your agency completed a meter retrofit plan?

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered?

Are all new service connections being billed volumetrically?

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?

Meters Matrix

Account Type	Num Of Metered Accounts	Num Of Metered Accounts Read	Num Of Metered Accounts Billed By Volume	Billing Frequency	Estimated Bills Per Year	Meter Readings Per Year
Single-Family	9821	9821	9821	Bi-monthly	6	6
Multi-Family	119	119	119	Bi-monthly	6	6
Commercial	240	240	240	Bi-monthly	6	6
Institutional	11	11	11	Bi-monthly	6	6
Dedicated Irrigation	206	206	206	Bi-monthly	6	6
Agricultural	5	5	5	Bi-monthly	6	6
Other	8	8	8	Bi-monthly	6	6

Number of CII Accounts with Mixed-use Meters: Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period:

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?

If YES, please fill in the following information:
 A. When was the Feasibility Study conducted

Describe, upload or provide an electronic link to the Feasibility Study Upload File



BMP 1.3 Metering With Commodity 2012

The SJWD July 22, 2011 Retail Financial Plan examined the low cost of water for the district, resulting in lower revenues. Based on the plan, installation of dedicated water meters was deemed not cost effective as a water conservation measure.

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At Least As effective As

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Exemption

Comments:

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BMP 1.3 Metering With Commodity 2013

Reporting unit name: Reporting unit number:

Implementation

Does your agency have any unmetered service connections?

If YES, has your agency completed a meter retrofit plan?

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered?

Are all new service connections being billed volumetrically?

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?

Meters Matrix

Account Type	Num Of Metered Accounts	Num Of Metered Accounts Read	Num Of Metered Accounts Billed By Volume	Billing Frequency	Estimated Bills Per Year	Meter Readings Per Year
Single-Family	9864	9864	9864	Bi-monthly	6	6
Multi-Family	119	119	119	Bi-monthly	6	6
Commercial	242	242	242	Bi-monthly	6	6
Institutional	11	11	11	Bi-monthly	6	6
Dedicated Irrigation	204	204	204	Bi-monthly	6	6
Agricultural	5	5	5	Bi-monthly	6	6
Other	8	8	8	Bi-monthly	6	6

Number of CII Accounts with Mixed-use Meters: Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period:

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?

If YES, please fill in the following information:

A. When was the Feasibility Study conducted

Describe, upload or provide an electronic link to the Feasibility Study Upload File



BMP 1.3 Metering With Commodity 2013

At Least As effective As

No

Exemption

No

Comments:



BMP 1.4 Retail Conservation Pricing 2011

Reporting unit name

San Juan Water District - Retail

Reporting unit number:

199

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Implementation (Conservation Pricing Option)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Use Annual Revenue As Reported

Use Canadian Water Wastewater (CWWA) Association Rate Design Model

Use 3 years average instead of most recent year

If CWWA is selected, please upload spreadsheet here.

Copy2_of_RATEMODEL-SJWD_7-26-11.xlsx

Canadian Water and Wastewater Association

Customer Class	Water Rate Type	Total Revenue Comodity Charges	Total Revenue Fixed Carges
Other	Uniform	5526	5526
Other	Other	2305	2305
		7831	7831

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service

No

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

At Least As effective As

No

Exemption

No

Comments:



BMP 1.4 Retail Conservation Pricing 2012

Reporting unit name

San Juan Water District - Retail

Reporting unit number:

199

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Implementation (Conservation Pricing Option)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Use Annual Revenue As Reported

Use Canadian Water Wastewater (CWWA) Association Rate Design Model

Use 3 years average instead of most recent year

If CWWA is selected, please upload spreadsheet here.

Copy_of_Canadian_MODEL-SJWD.xlsx

Canadian Water and Wastewater Association

Customer Class	Water Rate Type	Total Revenue Comodity Charges	Total Revenue Fixed Carges
Other	Other	2370	2370
Other	Uniform	5721	5721
		8091	8091

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

At Least As effective As

Exemption

Comments:



BMP 1.4 Retail Conservation Pricing 2013

Reporting unit name

San Juan Water District - Retail

Reporting unit number:

199

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Implementation (Conservation Pricing Option)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Use Annual Revenue As Reported

Use Canadian Water Wastewater (CWWA) Association Rate Design Model

Use 3 years average instead of most recent year

If CWWA is selected, please upload spreadsheet here.

SJWD Option 2 Model Beta Test.xlsx

Canadian Water and Wastewater Association

Customer Class	Water Rate Type	Total Revenue Comodity Charges	Total Revenue Fixed Carges
Other	Uniform	6096	6096
Other	Other	2512	2512
		8608	8608

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service

No

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

At Least As effective As

No

Exemption

No

Comments:



BMP 2.1 Public Outreach

2011

Reporting unit name

Reporting unit #

/

Does your agency perform Public Outreach programs?

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year?

Number of Public Contacts	Public Information Programs Name
6	Newsletter articles on conservation
12	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information
1	Website
873	Email Messages
10379	General water conservation information
1	Landscape water conservation media campaigns

Contact with the Media

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

Did at least one contact take place during each quarter of the reporting year?

Number of Media Contacts	Public Outreach Media Contact Name List
5	News releases
5	Television contacts
4	Articles or stories resulting from outreach
2	Editorial board visits



BMP 2.1 Public Outreach

2011

4	Articles or stories resulting from outreach
5	Radio contacts

Wholesale Agency Website Updates

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

No

San Juan Water District - Wholesale

Please provide the name of Agency if not CUWCC Group1 members

SJWD Wholesale and Retail in partnership with the Regional Water Authority.

Agency Website Updates

Enter your agency's URL (website address):

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

Indoor/Outdoor Water Efficiency Rebates
 Landscape/Water Efficiency Workshops
 Lake Levels and subsequent conservation requests
 Indoor/Outdoor Water Tips
 Find a Leak Info
 How to Read Your Meter

Did at least one Website Update take place during each quarter of the reporting year? Yes

Public Information Programs Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or break the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Annual Budget Category	Annual Budget Amount	Personal Cost Included?	Comments
Public Information	63284	V	Consultant Costs (only)

Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Public Outreach Expense Category	Expense Amount	Personal Cost Included?
Public Information	488720	V

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important / effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? Yes



Public Outreach Additional Information

Public Information Additional Programs	Importance
SJWD Wholesale and Retail in partnership with the Regional Water Authority	2

Social Marketing Programs

Branding Does your agency have a water conservation "brand," "theme" or mascot?

Describe the brand, theme or mascot.

Market Research Have you sponsored or participated in market research to refine your message?

Market Research Topic

Brand Message

Brand Mission Statement

Community Committees

Do you have a community conservation committee?

Enter the names of the community committees:

Training

Training Type	Number of Trainings	Number of Attendees	Description of Other
4	5	128	Workshops

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
Social Marketing	4700	Facebook initiated, posts and calendar.

Partnering Programs

Name	Type of Program
<input type="checkbox"/> CLCA?	<input type="text" value="Green Gardener through RWA"/>
<input type="checkbox"/> Green Building Programs?	<input type="text" value="Green Gardener through RWA"/>
<input type="checkbox"/> Master Gardeners?	
<input type="checkbox"/> Cooperative Extension?	
<input type="checkbox"/> Local Colleges?	
<input checked="" type="checkbox"/> Other	



BMP 2.1 Public Outreach

2011

Retail and wholesale outlet; name(s) and type(s) of programs:

WEL Garden

Partnering Programs - Newsletters

Number of newsletters per year

Number of customers per year

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

Sacramento Municipal Utility District and Pacific Gas and Electric through RWA rebate program.

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new homes

San Juan Water District's Water Efficient Landscape (WEL) Garden provides inspiration to create a landscapes that look beautiful every season. The garden demonstrates efficient irrigation and is filled with a variety of drought-tolerant plants.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

Blue Thumb Campaign Video Contest

Additional Programs supported by Agency but not mentioned above:

The Green Gardener Training Program combines cutting-edge technology with ecologically sound landscape maintenance practices including Soil Health; Integrated Pest Management; Right Plant, Right Place; Fertilizer Management; and Water Efficiency.

At Least As effective As

No

Exemption

No

0

Comments



BMP 2.1 Public Outreach

2012

Reporting unit name

Reporting unit #

/

Does your agency perform Public Outreach programs?

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year?

Number of Public Contacts	Public Information Programs Name
125	Website
14	Newsletter articles on conservation
36	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information
1	Landscape water conservation media campaigns
16	General water conservation information
29	Newsletter articles on conservation

Contact with the Media

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

Did at least one contact take place during each quarter of the reporting year?

Number of Media Contacts	Public Outreach Media Contact Name List
4	Newspaper contacts
14	Articles or stories resulting from outreach
2	Television contacts

Wholesale Agency Website Updates

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP



BMP 2.1 Public Outreach

2012

San Juan Water District - Wholesale

Please provide the name of Agency if not CUWCC Group1 members

SJWD Wholesale and Retail in partnership with the Regional Water Authority.

Agency Website Updates

Enter your agency's URL (website address):

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

Rebate Information
Landscape Workshops
Second Annual Landscape and Garden (Irrigation) Field Day
Blue Thumb Campaign

Did at least one Website Update take place during each quarter of the reporting year?

Public Information Programs Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or break the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Annual Budget Category	Annual Budget Amount	Personal Cost Included?	Comments
Public Information	67420	V	Consultant Costs (only)

Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Public Outreach Expense Category	Expense Amount	Personal Cost Included?
Public Information	431000	V

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important / effective listed first (where 1 = most important).

Were there additional Public Outreach efforts?

Public Outreach Additional Information

Public Information Additional Programs	Importance
SJWD Wholesale and Retail in partnership with the Regional Water Authority.	2

Social Marketing Programs

Branding Does your agency have a water conservation "brand," "theme" or mascot?

Describe the brand, theme or mascot.



BMP 2.1 Public Outreach

2012

Market Research

Have you sponsored or participated in market research to refine your message?

Market Research Topic

Brand Message

Brand Mission Statement

Community Committees

Do you have a community conservation committee?

Enter the names of the community committees:

Training

Training Type	Number of Trainings	Number of Attendees	Description of Other
4	5	127	Workshops

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
Facebook	3727	Startup

Partnering Programs

Name

Type of Program

CLCA?

Green Building Programs?

Master Gardeners?

Cooperative Extension?

Local Colleges?

Other

Retail and wholesale outlet; name(s) and type(s) of programs:

Partnering Programs - Newsletters

Number of newsletters per year

Number of customers per year

Partnering with Other Utilities



BMP 2.1 Public Outreach

2012

Describe other utilities your agency partners with, including electrical utilities

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new homes

San Juan Water District's Water Efficient Landscape (WEL) Garden provides inspiration to create a landscapes that look beautiful every season. The garden demonstrates efficient irrigation and is filled with a variety of drought-tolerant plants.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

Blue Thumb Campaign through the Regional Water Authority

Additional Programs supported by Agency but not mentioned above:

The Green Gardener Training Program combines cutting-edge technology with ecologically sound landscape maintenance practices including Soil Health; Integrated Pest Management; Right Plant, Right Place; Fertilizer Management; and Water Efficiency.

At Least As effective As

No

Exemption

No

0

Comments



BMP 2.1 Public Outreach

2013

Reporting unit name

Reporting unit #

/

Does your agency perform Public Outreach programs?

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year?

Number of Public Contacts	Public Information Programs Name
6	Newsletter articles on conservation
12	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information
2	Website
4	Landscape water conservation media campaigns
10453	General water conservation information
453	Email Messages

Contact with the Media

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

Did at least one contact take place during each quarter of the reporting year?

Number of Media Contacts	Public Outreach Media Contact Name List
5	News releases

Wholesale Agency Website Updates

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

Agency Website Updates

Enter your agency's URL (website address):



BMP 2.1 Public Outreach

2013

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

Indoor/Outdoor Water Efficiency Rebates
 Landscape/Water Efficiency Workshops
 Lake Levels and subsequent conservation requests
 Indoor/Outdoor Water Tips
 Water Waster & Find-A-Leak Videos
 Find a Leak Info
 How to Read Your Meter

Did at least one Website Update take place during each quarter of the reporting year?

Public Information Programs Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or break the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Annual Budget Category	Annual Budget Amount	Personal Cost Included?	Comments
Public Information	72733	V	Consultant Costs (only)

Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Public Outreach Expense Category	Expense Amount	Personal Cost Included?
SJWD Public Interanal Costs	477500	V

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important / effective listed first (where 1 = most important).

Were there additional Public Outreach efforts?

Public Outreach Additional Information

Public Information Additional Programs	Importance
SJWD Wholesale and Retail in partnership with the Regional Water Authority.	2

Social Marketing Programs

Branding Does your agency have a water conservation "brand," "theme" or mascot?

Describe the brand, theme or mascot.

Market Research Have you sponsored or participated in market research to refine your message?

Market Research Topic

Brand Message

Brand Mission Statement

Community Committees



BMP 2.1 Public Outreach

2013

Do you have a community conservation committee?

Enter the names of the community committees:

Training

Training Type	Number of Trainings	Number of Attendees	Description of Other
4	5	165	Workshops

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
Media	5565	Facebook posts, contests, YouTube Videos and Calendar

Partnering Programs

Name	Type of Program
<input type="checkbox"/> CLCA?	<input type="text" value="Green Gardener through RWA"/>
<input type="checkbox"/> Green Building Programs?	<input type="text" value="Green Gardener through RWA"/>
<input type="checkbox"/> Master Gardeners?	
<input type="checkbox"/> Cooperative Extension?	
<input type="checkbox"/> Local Colleges?	
<input checked="" type="checkbox"/> Other	
<input checked="" type="checkbox"/> Retail and wholesale outlet; name(s) and type(s) of programs:	
<input type="text" value="WEL Garden"/>	

Partnering Programs - Newsletters

Number of newsletters per year Number of customers per year

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new homes

Landscape contests or awards



BMP 2.1 Public Outreach

2013

Describe water wise landscape contest or awards program conducted by your agency

Additional Programs supported by Agency but not mentioned above:

The Green Gardener Training Program combines cutting-edge technology with ecologically sound landscape maintenance practices including Soil Health; Integrated Pest Management; Right Plant, Right Place; Fertilizer Management; and Water Efficiency.

At Least As effective As

No

Exemption

No

0

Comments



BMP 2.2 School Education Programs 2011

Reporting unit name Reporting unit #
 /

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing school education programs which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

<input checked="" type="checkbox"/> Materials meet state education framework requirements?	Description	Educational materials provided meet the state education framework requirements and are grade appropriate using Project WET and the California Environmental Education Initiative as guides along with local public school districts.
--	-------------	--

<input checked="" type="checkbox"/> Materials distributed to K-6 Students?	Description	Student newspaper supplement called Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee to all (K-12)
--	-------------	---

Number of students reached

<input checked="" type="checkbox"/> Materials distributed to 7-12 Students? (optional)	Description	Student newspaper supplement called Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee to all (K-12)
--	-------------	---

Annual budget for school education program

Description of all other water supplier education programs

School Programs Activities

Classroom Presentation:
Number of presentation Number of attendees

Describe the topics covered in your classroom presentations:

Large group assemblies:
Number of presentation Number of attendees

Children's water festivals or other events:
Number of presentation Number of attendees

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentation Number of attendees

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description Number distributed

Staffing children's booths at events & festivals:

Number of booths Number of attendees

Water conservation contests such as poster and photo:

Description Number of participants



BMP 2.2 School Education Programs 2011

Offer monetary awards/funding or scholarships to students:

Number offered

Total funding

Teacher training workshops:

Number of presentation

Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or fieldtrips

Number of participants

College internships in water conservation offered:

Number of internship

Total funding

Career Fairs / Workshops:

Number of presentation

Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description

Number of events

Number of participants

Comments

At Least As effective As

Exemption



BMP 2.2 School Education Programs 2012

Reporting unit name Reporting unit #
 /

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing school education programs which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

<input checked="" type="checkbox"/>	Materials meet state education framework requirements?	Description	The District maintains a school education program that covers urban and environmental water issues and conditions in the local watershed through presentations and instructional assistance. All materials provided meet the State education requirements.
-------------------------------------	--	-------------	--

<input checked="" type="checkbox"/>	Materials distributed to K-6 Students?	Description	The District participates with other water agencies in a water awareness poster contest each year and invites students from grades 4-6 to participate. District staff makes class presentations to teach water efficiency and conservation.
-------------------------------------	--	-------------	---

Number of students reached

<input checked="" type="checkbox"/>	Materials distributed to 7-12 Students? (optional)	Description	SJWD and RWA support the Sacramento Bee's Media in Education (MIE) program. Funded and managed by RWA, the MIE offers state framework water efficiency materials to over 700 classrooms and more than more than 24,000 students in the Sacramento region.
-------------------------------------	--	-------------	---

Annual budget for school education program

Description of all other water supplier education programs

School Programs Activities

Classroom Presentation:

Number of presentation Number of attendees

Describe the topics covered in your classroom presentations:

Large group assemblies:

Number of presentation Number of attendees

Children's water festivals or other events:

Number of presentation Number of attendees

Cooperative efforts with existing science/water education programs (various workshops, science fair awardsor judging) and follow-up:

Number of presentation Number of attendees

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description Number distributed

Staffing children's booths at events & festivals:

Number of booths Number of attendees

Water conservation contests such as poster and photo:



BMP 2.2 School Education Programs 2012

Description

SJWD participates with other water agencies in a water awareness poster contest each year and invites students from grades 4-6 to participate. District staff makes class presentations each year to teach water efficiency and conservation.

Number of participants

Offer monetary awards/funding or scholarships to students:

Number offered

Total funding

Teacher training workshops:

Number of presentation

Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or fieldtrips

Number of participants

College internships in water conservation offered:

Number of internship

Total funding

Career Fairs / Workshops:

Number of presentation

Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description

Number of events

Number of participants

Comments

At Least As effective As

No

Exemption

No

0



BMP 2.2 School Education Programs 2013

Reporting unit name Reporting unit #
 /

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing school education programs which can be counted to help the agency comply with the BMP

Please provide the name of Agency if not CUWCC Group1 members

<input checked="" type="checkbox"/> Materials meet state education framework requirements?	Description	Educational materials provided meet the state education framework requirements and are grade appropriate using Project WET and the California Environmental Education Initiative as guides along with local public school districts.
--	-------------	--

<input checked="" type="checkbox"/> Materials distributed to K-6 Students?	Description	A student newspaper supplement called Be Water Smart News, Water, the Never Ending Cycle includes activities and illustrations.
--	-------------	---

Number of students reached

<input checked="" type="checkbox"/> Materials distributed to 7-12 Students? (optional)	Description	A student newspaper supplement called Be Water Smart News, Water, the Never Ending Cycle includes activities and illustrations.
--	-------------	---

Annual budget for school education program

Description of all other water supplier education programs

School Programs Activities

Classroom Presentation:

Number of presentation Number of attendees

Describe the topics covered in your classroom presentations:

Large group assemblies:

Number of presentation Number of attendees

Children's water festivals or other events:

Number of presentation Number of attendees

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentation Number of attendees

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description Number distributed

Staffing children's booths at events & festivals:

Number of booths Number of attendees

Water conservation contests such as poster and photo:

Description Number of participants



BMP 2.2 School Education Programs 2013

Offer monetary awards/funding or scholarships to students:

Number offered

Total funding

Teacher training workshops:

Number of presentation

Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or fieldtrips

Number of participants

College internships in water conservation offered:

Number of internship

Total funding

Career Fairs / Workshops:

Number of presentation

Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description

Number of events

Number of participants

Comments

At Least As effective As

Exemption



Reporting Unit Name
San Juan Water District - Retail
Retail Only

Reporting Unit ID#:
199

2012 Non Potable Water Sources

Service Area Population: 30663

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed	13936.00	Surface	Folsom Lake
	13936.00		



Reporting Unit Name
San Juan Water District - Retail
Retail Only

Reporting Unit ID#: **199**

2013 Non Potable Water Sources

Service Area Population: 30873

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed	14944.85	Surface	Folsom Lake
	14944.85		



Reporting Unit Name

San Juan Water District - Retail

Retail Only

Reporting Unit ID#:

199

2011

Potable Water Sources

Service Area Population:

30663

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed	12508.00	Surface	Folsom Lake
	12508.00		



Reporting Unit Name

San Juan Water District - Retail

Retail Only

Reporting Unit ID#:

199

2012

Potable Water Sources

Service Area Population:

30722

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed	13935.85	Surface	Folsom Lake
	13935.85		



Reporting Unit Name

San Juan Water District - Retail

Retail Only

Reporting Unit ID#:

199

2013

Potable Water Sources

Service Area Population:

30873

Local Watershed	AF / Year	Water Supply Type	Water Supply Description
American River Watershed	14944.85	Surface	Folsom Lake
	14944.85		



Reporting Unit Name
San Juan Water District - Retail
Retail Only

Reporting Unit ID#:
199

2011 Potable Water Uses

Billed:

CustomerType	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered Accounts	Un-Metered Water Delivered AF/Year	Description
Single-Family	9791	9621.90	0	0.00	
Multi-Family	120	181.30	0	0.00	
Commercial	238	439.00	0	0.00	
Dedicated Irrigation	207	784.00	0	0.00	
Other	8	1.90			Sewer Lift/Pump Station
Institutional	11	152.60			
Agricultural	4	19.70			
	10379	11200.40	0	0.00	

Un-Billed:



Reporting Unit Name
San Juan Water District - Retail
Retail Only

Reporting Unit ID#:
199

2012 Potable Water Uses

Billed:

CustomerType	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered Accounts	Un-Metered Water Delivered AF/Year	Description
Single-Family	9821	10876.00	0	0.00	
Multi-Family	119	195.54	0	0.00	
Commercial	240	389.87	0	0.00	
Dedicated Irrigation	206	892.33	0	0.00	
Other	8	3.66	0	0.00	Sewer Lift /Pump Station
Industrial	11	218.15	0	0.00	
Agricultural	5	25.45	0	0.00	
	10410	12601.00	0	0.00	

Un-Billed:



Reporting Unit Name
San Juan Water District - Retail
Retail Only

Reporting Unit ID#:
199

2013 Potable Water Uses

Billed:

CustomerType	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered Accounts	Un-Metered Water Delivered AF/Year	Description
Single-Family	9864	11722.01			
Multi-Family	119	183.30			
Commercial	242	490.92			
Dedicated Irrigation	204	1033.00			
Other	8	2.53			Sewer Lift/Pump Station
Institutional	11	272.38			
Agricultural	5	32.81			
	10453	13736.95			

Un-Billed:



CUWCC BMP Retail Coverage Report 2011

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

199 San Juan Water District - Retail

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name: Vicki Sacksteder
 Title: Water Resources Analyst
 Email: vsacksteder@sjwd.org

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.	San Juan Water District Retail BMP 1-1 2009 11000 Prohibited Practices.pdf		San Juan Water District Code of Ordinances contains two water waste ordinances. Prohibited Practices include 11000.01 Leaks or Wasteful Use of Water and 23000.04 Penalties for Water Waste under Any Conservation Stage amended August 1, 2008.
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			N/A
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			N/A
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			N/A
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			N/A
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			N/A

At Least As effective As



CUWCC BMP Retail Coverage Report 2011

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

N/A

Exemption

No

Comments:

N/A



CUWCC BMP Retail Coverage Report 2012

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

199 San Juan Water District - Retail

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name:

Title:

Email:

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.	San Juan Water District Water Waste Preventions Ordinances.pdf		San Juan Water District Code of Ordinances contains two water waste ordinances. Prohibited Practices include 11000.01 Leaks or Wasteful Use of Water and 23000.04 Penalties for Water Waste under Any Conservation Stage amended August 1, 2008.
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			N/A
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			N/A
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			N/A
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			N/A
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			N/A

At Least As effective As



CUWCC BMP Retail Coverage Report 2012
Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

N/A

Exemption

No

Comments:

N/A



CUWCC BMP Retail Coverage Report 2013

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

199 San Juan Water District - Retail

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name:

Title:

Email:

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.	Copy2 of 11000 Prohibited Practices Prohibited Practices and Enforcement Measures.pdf		San Juan Water District Code of Ordinances contains two water waste ordinances. Prohibited Practices include 11000.01 Leaks or Wasteful Use of Water and 23000.04 Penalties for Water Waste under Any Conservation Stage amended August 1, 2008.
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As



CUWCC BMP Retail Coverage Report 2013
Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

Exemption

Comments:



CUWCC BMP Retail Coverage Report 2014

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

199 San Juan Water District - Retail

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name:

Lisa Brown

Title:

Customer Service Manager

Email:

lbrown@sjwd.org

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.			San Juan Water District Code of Ordinances contain two water waste ordinances. Prohibited Practices include 11000.01 Leaks or Wasteful Use of Water and 23000.04 Penalties for Water Waste Under Any Conservation Stage amended August 1, 2008.
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			San Juan Water District Code of Ordinances contain two water waste ordinances. Prohibited Practices include 11000.01 Leaks or Wasteful Use of Water and 23000.04 Penalties for Water Waste Under Any Conservation Stage amended August 1, 2008.
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			



CUWCC BMP Retail Coverage Report 2014
Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

At Least As effective As

No

Exemption

No

Comments:



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

199 San Juan Water District - Retail

Completed Standard Water Audit Using AWWA Software? Yes

AWWA File provided to CUWCC? Yes

2011 Completed AWWA Water Loss Control Reporting Worksheet.xls

AWWA Water Audit Validity Score? 93

Complete Training in AWWA Audit Method Yes

Complete Training in Component Analysis Process? Yes

Component Analysis? No

Repaired all leaks and breaks to the extent cost effective? Yes

Locate and Repair unreported leaks to the extent cost effective? Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

199 San Juan Water District - Retail

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
2012 AWWA Water Loss Control Reporting Worksheet.xls	
AWWA Water Audit Validity Score?	93
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	No
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repair unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
80			1.5	False		71.2

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

199 San Juan Water District - Retail

- Completed Standard Water Audit Using AWWA Software? Yes
- AWWA File provided to CUWCC? Yes
- 2013 AWWA Water Loss Control Reporting Worksheet.xls
- AWWA Water Audit Validity Score? 93
- Complete Training in AWWA Audit Method Yes
- Complete Training in Component Analysis Process? Yes
- Component Analysis? Yes
- Repaired all leaks and breaks to the extent cost effective? Yes
- Locate and Repair unreported leaks to the extent cost effective? Yes
- Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

199 San Juan Water District - Retail

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
2014_AWWA Water Audit Reportxls.xls	
AWWA Water Audit Validity Score?	78
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	Yes
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repair unreported leaks to the extent cost effective?	Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
120			6.27	True		102

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

199 San Juan Water District - Retail

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	218
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes
Date:	6/22/2011
Uploaded file name:	2011 Retail Financial Plan.pdf
Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

199 San Juan Water District - Retail

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	251
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes
Date: 7/22/2011	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

199 San Juan Water District - Retail

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	0
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes
Date:	6/22/2011
Uploaded file name:	Copy_of_2011_Retail_Financial_Plan.pdf
Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>

Comments:



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

199 San Juan Water District - Retail

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	0
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes
Date: 6/22/2011	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

On Track

199 San Juan Water District - Retail

Implementation (Water Rate Structure)

Implementation Option: Use Canadian Water Wastewater Association Rate Design Model

Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Commodity Charges	(M) Total Revenue Fixed Charges
Other	Uniform	Yes	5526	5526
Other	Other	No	2305	2305
			7831	7831

Calculate: $V / (V + M)$ 50 %

Upload file: Copy2_of_RATEMODEL-SJWD_7-26-11.xlsx

Agency Provide Sewer Service: No

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

On Track

199 San Juan Water District - Retail

Implementation (Water Rate Structure)

Implementation Option: Use Canadian Water Wastewater Association Rate Design Model

Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Commodity Charges	(M) Total Revenue Fixed Carges
Other	Other	No	2370	2370
Other	Uniform	Yes	5721	5721
			8091	8091

Calculate: $V / (V + M)$ 50 %

Upload file: Copy_of_Canadian_MODEL-SJWD.xlsx

Agency Provide Sewer Service: No

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

On Track

199 San Juan Water District - Retail

Implementation (Water Rate Structure)

Implementation Option: Use Canadian Water Wastewater Association Rate Design Model

Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Commodity Charges	(M) Total Revenue Fixed Charges
Other	Uniform	Yes	6096	6096
Other	Other	No	2512	2512
			8608	8608

Calculate: $V / (V + M)$ 50 %

Upload file: SJWD Option 2 Model Beta Test.xlsx

Agency Provide Sewer Service: No

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

199 San Juan Water District - Retail

Implementation (Water Rate Structure)

Implementation Option: Use Canadian Water Wastewater Association Rate Design Model

Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Customer Class	Water Rate Type	Conserving Rate?	(V') Total Revenue Commodity Charges	(M') Total Revenue Fixed Charges
Single-Family	Increasing Block	Yes	2669819.4	4353175.21
Commercial	Uniform	Yes	425655.28	629864.09
			3095474.68	4983039.3

Calculate: $V / (V + M)$ 38 %

Upload file:

Agency Provide Sewer Service: No

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

199 San Juan Water District - Retail

Retail

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Juan Water District - Wholesale
SJWD Wholesale and Retail in partnership with the Regional Water Authority.

The name of agency, contact name and email address if not CUWCC Group 1 members

San Juan Water District

Did at least one contact take place during each quarter of the reporting year? Yes

Public Outreach Program List	Number
Newsletter articles on conservation	6
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	12
Website	1
Email Messages	873
General water conservation information	10379
Landscape water conservation media campaigns	1
Total	11272

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
News releases	5
Television contacts	5
Articles or stories resulting from outreach	4
Editorial board visits	2
Articles or stories resulting from outreach	4
Radio contacts	5
Total	25

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Information	63284
Total Amount:	63284



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

Public Outreach Additional Programs

SJWD Wholesale and Retail in partnership with the Regional Water Authority

Description of all other Public Outreach programs

WEL Garden

Comments:

At Least As effective As

Exemption



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

199 San Juan Water District - Retail

Retail

Does your agency perform Public Outreach programs? **Yes**

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Juan Water District - Wholesale
SJWD Wholesale and Retail in partnership with the Regional Water Authority.

The name of agency, contact name and email address if not CUWCC Group 1 members

San Juan Wholesale Water District

Did at least one contact take place during each quarter of the reporting year? **Yes**

Public Outreach Program List	Number
Website	125
Newsletter articles on conservation	14
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	36
Landscape water conservation media campaigns	1
General water conservation information	16
Newsletter articles on conservation	29
Total	221

Did at least one contact take place during each quarter of the reporting year? **Yes**

Number Media Contacts	Number
Newspaper contacts	4
Articles or stories resulting from outreach	14
Television contacts	2
Total	20

Did at least one website update take place during each quarter of the reporting year? **Yes**

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Information	67420
Total Amount:	67420

Public Outreach Additional Programs

SJWD Wholesale and Retail in partnership with the Regional Water Authority.

Description of all other Public Outreach programs



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

WEL Garden Landcape Workshops/Classes

Comments:

At Least As effective As

Exemption



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

199

San Juan Water District - Retail

Retail

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Juan Water District - Wholesale
SJWD Wholesale and Retail in partnership with the Regional Water Authority.

The name of agency, contact name and email address if not CUWCC Group 1 members

San Juan Water District

Did at least one contact take place during each quarter of the reporting year? Yes

Public Outreach Program List	Number
Newsletter articles on conservation	6
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	12
Website	2
Landscape water conservation media campaigns	4
General water conservation information	10453
Email Messages	453
Total	10930

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
News releases	5
Total	5

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Information	72733
Total Amount:	72733

Public Outreach Additional Programs

SJWD Wholesale and Retail in partnership with the Regional Water Authority.

Description of all other Public Outreach programs

WEL Garden



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

Comments:

At Least As effective As

Exemption



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

199

San Juan Water District - Retail

Retail

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Juan Water District - Wholesale
Regional Water Authority; Amy Talbot, atalbot@rwah2o.org.

Agency Name	ID number
San Juan Water District - Wholesale	2007

The name of agency, contact name and email address if not CUWCC Group 1 members

WEL Garden

Did at least one contact take place during each quarter of the reporting year? Yes

Public Outreach Program List	Number
Newsletter articles on conservation	6
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	15
Website	12
Landscape water conservation media campaigns	1
General water conservation information	1752
Email Messages	53
Total	1839

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	88
News releases	19
Newspaper contacts	40
Radio contacts	17
Television contacts	60
Written editorials	1
Total	225

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

Annual Budget Category	Annual Budget Amount
Public Outreach - Retail	51610
Regional Water Authority dues	4000
Email distribution	560
bill insert and print costs	10567
Total Amount:	66737

Public Outreach Additional Programs

booths at local fairs and events

Description of all other Public Outreach programs

San Juan Wholesale water efficient landscape garden

Comments:

At Least As effective As

No

Exemption

No

0



CUWCC BMP Coverage Report 2011

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

199 San Juan Water District - Retail

Retail

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Juan Water District - Wholesale

Regional Water Authority - Sacramento

Materials meet state education framework requirements? Yes

Educational materials provided meet the state education framework requirements and are grade appropriate using Project WET and the California Environmental Education Initiative as guides along with local public school districts.

Materials distributed to K-6? Yes

Student newspaper supplement called Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee to all (K-12)

Materials distributed to 7-12 students? Yes (Info Only)

Student newspaper supplement called Be Water Smart News, Water, the Never Ending Cycle is distributed by the Sacramento Bee to all (K-12)

Annual budget for school education program: 5745.00

Description of all other water supplier education programs
Calendar/ Poster Contest

Comments:

At Least As effective As No

Exemption No 0



CUWCC BMP Coverage Report 2012

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

199 San Juan Water District - Retail

Retail

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Juan Water District - Wholesale

Regional Water Authority - Sacramento

Materials meet state education framework requirements? Yes

The District maintains a school education program that covers urban and environmental water issues and conditions in the local watershed through presentations and instructional assistance. All materials provided meet the State education requirements.

Materials distributed to K-6? Yes

The District participates with other water agencies in a water awareness poster contest each year and invites students from grades 4-6 to participate. District staff makes class presentations to teach water efficiency and conservation.

Materials distributed to 7-12 students? Yes (Info Only)

SJWD and RWA support the Sacramento Bee's Media in Education (MIE) program. Funded and managed by RWA, the MIE offers state framework water efficiency materials to over 700 classrooms and more than more than 24,000 students in the Sacramento region.

Annual budget for school education program: 22000.00

Description of all other water supplier education programs

Comments:

At Least As effective As No

Exemption No 0



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

199 San Juan Water District - Retail

Retail

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Juan Water District - Wholesale

Regional Water Authority - Sacramento

Materials meet state education framework requirements? Yes

Educational materials provided meet the state education framework requirements and are grade appropriate using Project WET and the California Environmental Education Initiative as guides along with local public school districts.

Materials distributed to K-6? Yes

A student newspaper supplement called Be Water Smart News, Water, the Never Ending Cycle includes activities and illustrations.

Materials distributed to 7-12 students? Yes (Info Only)

A student newspaper supplement called Be Water Smart News, Water, the Never Ending Cycle includes activities and illustrations.

Annual budget for school education program: 5793.00

Description of all other water supplier education programs
Calendar/Poster Contest

Comments:

At Least As effective As No

Exemption No 0



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

199 San Juan Water District - Retail

Retail

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Juan Water District - Wholesale

Regional Water Authority, Amy Talbot, atalbot@rwah2o.org

Agencies Name	ID number
San Juan Water District - Wholesale	2007

Materials meet state education framework requirements? Yes

Be Water Smart News, Water, the Never Ending Cycle includes activities and illustrations and teaches about the water cycle. K-8Be Water Smart News teacher's guide - lessons based on CA Content Standards. Living Rivers of the Sacramento Valley.

Materials distributed to K-6? Yes

Water education supplements for The Sacramento Bee's Media in Education program, DWR CA waterways map, Mr. Leaky booklet. Be Water Smart News, Water, the Never Ending Cycle, Living Rivers of the Sacramento Valley.

Materials distributed to 7-12 students? Yes (Info Only)

Water education supplements for The Sacramento Bee's Media in Education program, Water Spots video contest information

Annual budget for school education program: 37200.00

Description of all other water supplier education programs

Water conservation poster contest open to Grades 4-6. Winners are featured in a Water Awareness calendar for the following year. Newspaper supplements learn about watersheds, ecology. WaterSpots Video contest learn about outdoor conservation.

Comments:

At Least As effective As No

Exemption No 0



CUWCC BMP Coverage Report 2012

199 San Juan Water District - Retail

GPCD in 2006: 442.57

GPCD in 2012 404.96

GPCD Target for 2018: 408.90

Biennial GPCD Compliance Table

ON TRACK

Year	Report	Target		Highest Acceptable Bound	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	480.71	100%	498.66
2012	2	92.8%	462.76	96.4%	480.71
2014	3	89.2%	444.80	92.8%	462.76
2016	4	85.6%	426.85	89.2%	444.80
2018	5	82.0%	408.90	82.0%	408.90



CUWCC BMP Coverage Report 2013

199 San Juan WD retail

GPCD in 2006: 442.6

GPCD in 2013 432.15

GPCD Target for 2018: 408.90

Biennial GPCD Compliance Table

ON TRACK

Year	Report	Target		Highest Acceptable Bound	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	480.70	100%	498.70
2012	2	92.8%	462.80	96.4%	480.70
2014	3	89.2%	444.80	92.8%	462.80
2016	4	85.6%	426.90	89.2%	444.80
2018	5	82.0%	408.90	82.0%	408.90



CUWCC BMP Coverage Report 2014

199 San Juan Water District - Retail

Baseline GPCD: 498.66

GPCD in 2014 318.36

GPCD Target for 2018: 408.90

Biennial GPCD Compliance Table

ON TRACK

Year	Report	Target		Highest Acceptable Bound	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	480.70	100%	498.70
2012	2	92.8%	462.80	96.4%	480.70
2014	3	89.2%	444.80	92.8%	462.80
2016	4	85.6%	426.90	89.2%	444.80
2018	5	82.0%	408.90	82.0%	408.90

Appendix I

2015 UWMP Adoption Resolution

AGENDA ITEM II-2

San Juan Water District

RESOLUTION 16-09 URBAN WATER MANAGEMENT PLAN UPDATE

WHEREAS, the Board of Directors has reviewed San Juan Water District's Final Draft 2015 Urban Water Management Plan Update; and

WHEREAS, a public hearing was conducted on May 25, 2016, accepting public testimony; and

WHEREAS, the Board of Directors found San Juan Water District's Final Draft 2015 Urban Water Management Plan Update, pursuant to the Urban Water Management Planning Act (Division 6, Part 2.6 of the California Water Code §10610 - 10656) to be in order.

NOW, THEREFORE, BE IT RESOLVED the Board of Directors of the San Juan Water District hereby approves the San Juan Water District 2015 Urban Water Management Plan Update, as required under the Urban Water Management Planning Act.

PASSED AND ADOPTED by the Board of Directors of the San Juan Water District on the 8th day of June 2016, by the following vote:

AYES: DIRECTORS: **Costa, Miller, Rich, Tobin**
NOES: DIRECTORS:
ABSENT: DIRECTORS: **Walters**



PAMELA TOBIN
President, Board of Directors



TERI GRANT
Secretary, Board of Directors

Appendix J

DWR Tables Not Used

Appendix J: Standardized DWR Tables Not Used

Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield (optional)
Other	San Juan Water District Wholesale Supply	43,796	Drinking Water	82,200
Total		43,796		82,200

NOTES: The District's retail service area supply is the same supply and supply volume that is available to the District's wholesale customer agencies.

Table 6-9 Retail: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply <i>Report To the Extent Practicable</i>				
		2020	2025	2030	2035	2040 (opt)
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Other	San Juan Water District Wholesale	82,200	82,200	82,200	82,200	82,200
Total		82,200	82,200	82,200	82,200	82,200

NOTES: The District's retail service area supply is the same supply and supply volume that is available to the District's wholesale customer agencies.

Table 7-1 Retail: Basis of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		Agency may provide volume only, percent only, or both	
		Volume Available	% of Average Supply
Average Year	2004	82,200	100%
Single-Dry Year	1977	61,150	74%
Multiple-Dry Years 1st Year	1990	61,150	74%
Multiple-Dry Years 2nd Year	1991	55,100	67%
Multiple-Dry Years 3rd Year	1992	55,100	67%

NOTES:
 1. Volume is in AFY.
 2. The District's retail service area supply is the same supply and supply volume that is available to the District's wholesale customer agencies.

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	82,200	82,200	82,200	82,200	82,200
Demand totals	15,855	16,773	17,624	18,509	19,393
Difference	66,345	65,427	64,576	63,691	62,807

NOTES:
 1. Supply and demand volumes are in AFY.
 2. Demands include future conjunctive use program.
 3. The District's retail service area water supply is the same as the District's wholesale customer agencies' supply.

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	54,200	54,200	54,200	54,200	54,200
Demand totals	16,390	17,329	18,143	19,019	19,895
Difference	37,810	36,871	36,057	35,181	34,305
NOTES: 1. Supply and demand volumes are in AFY. 2. Demands include reductions to meet SBX7-7 target water use and future conjunctive use program. 3. The District's retail service area water supply is the same as the District's wholesale customer agencies' supply.					

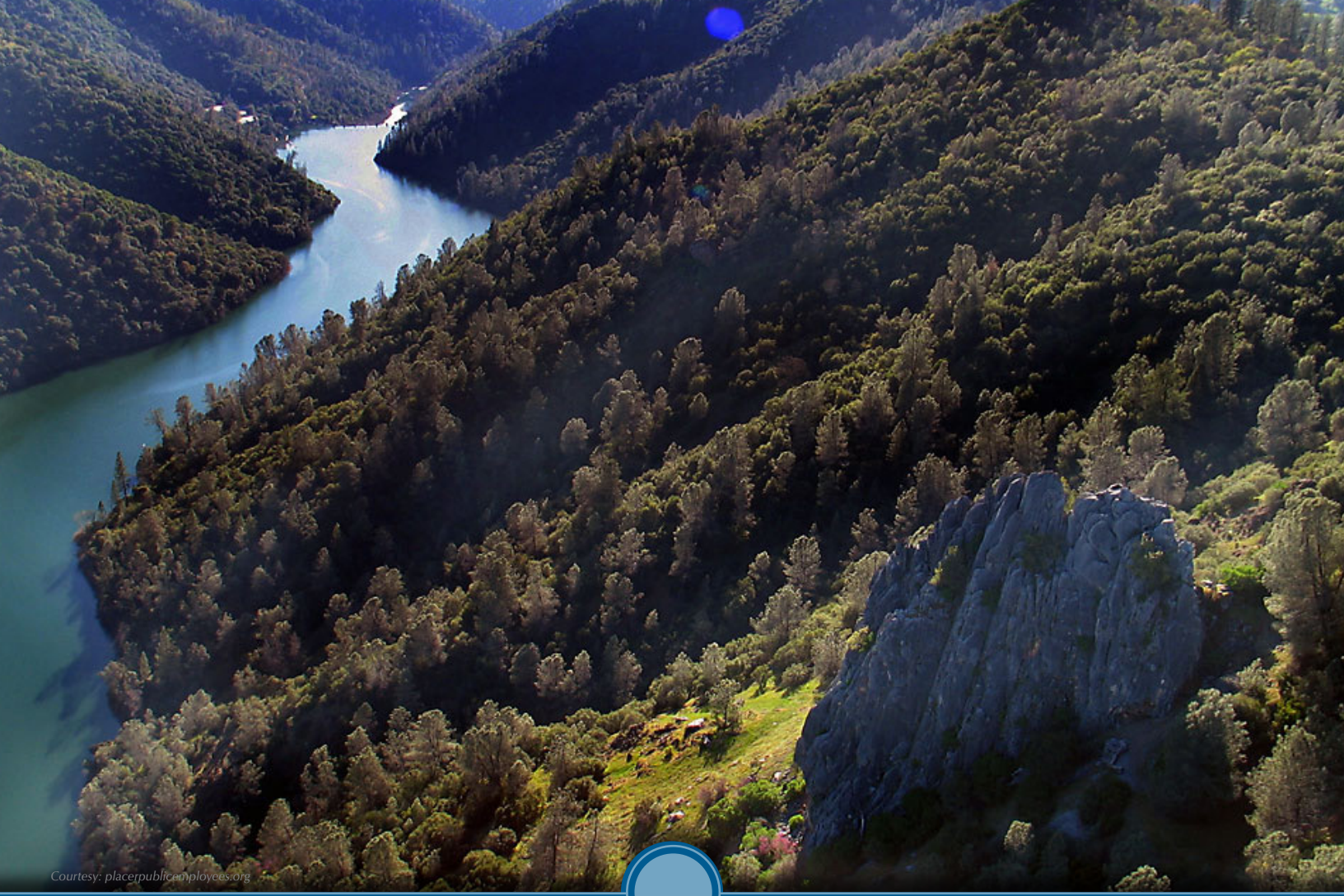
Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	54,200	54,200	54,200	54,200	54,200
	Demand totals	16,390	17,329	18,143	19,019	19,895
	Difference	37,810	36,871	36,057	35,181	34,305
Second year	Supply totals	54,200	54,200	54,200	54,200	54,200
	Demand totals	16,390	17,329	18,143	19,019	19,895
	Difference	37,810	36,871	36,057	35,181	34,305
Third year	Supply totals	54,200	54,200	54,200	54,200	54,200
	Demand totals	16,390	17,329	18,143	19,019	19,895
	Difference	37,810	36,871	36,057	35,181	34,305
NOTES: 1. Supply and demand volumes are in AFY. 2. Demands include reductions to meet SBX7-7 target water use and future conjunctive use program. 3. The District's retail service area water supply is the same as the District's wholesale customer agencies' supply.						

**Table 8-1 Retail
Stages of Water Shortage Contingency Plan**

Stage	Complete Both	
	Percent Supply Reduction ¹ <i>Numerical value as a percent</i>	Water Supply Condition <i>(Narrative description)</i>
1	0	Normal Water Conditions, GPCD Range = 413
2	5-10	Minimal supply reductions, GPCD Range = 370-390
3	11-25	Supplies not be able to meet demands, GPCD Range = 308-391
4	26-50	Supplies not able to meet demands, GPCD Range = 206-307
5	50 and greater	Major failure of a supply, storage, or distribution system, GPCD Range < 206
¹ One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		
NOTES: 1. Stages and conditions are draft. 2. Stages for the SJWD retail service area are the same for the SJWD wholesale service area. 3. Based on DWR Table 8-1 Wholesale.		

Table 8-4 Retail: Minimum Supply Next Three Years

	2016	2017	2018
Available Water Supply	54,200	54,200	54,200
NOTES: 1. Supply in units of AFY. 2. Based on Water Forum Agreement minimum Folsom Lake diversions for SJWD for drier (non-Conference) years. 3. The District's retail service area water supply is the same as the District's wholesale customer agencies' supply.			



Courtesy: placerpublicemployees.org

